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NOTE

This report covers all activities of agencies in the Department of Agriculture and the War Food Administration.

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REPORT OF THE

Secretary of Agriculture

1943

WASHINGTON, DECEMBER 1, 1943

To the President

FOOD IN THE WAR

As old as war is the axiom that an army fights on its stomach. This is truer than ever today since in total war the contestants comprise not merely the fighting men but whole populations, upon whose power to work depends the fighting men's power to fight.

Food is thus the source of military strength, the raw material both of fighting power and of weapons. It is supremely important in the American war effort since the American food supply must simultaneously support our civilians and our armed forces, contribute heavily to the needs of our allies, and insofar as possible help to feed the peoples that allied victories liberate. This last requirement, which will increase with the progress of our armies, has military as well as humanitarian importance. We want the liberated peoples to participate in the fight for freedom, and if they are to do so they must be fed.

One may realize this, however, and still have only a faint idea of the role that American food must play in the fight for freedom. It is necessary to look at the whole food picture, which stretches over the entire field of the allied nations' war effort.

This year, for the seventh year in succession, our farmers will set a new high record in food production (crops plus livestock). Nevertheless we do not have food enough to satisfy all needs, at home and abroad, not to mention all desires. Constantly the demand, military and civilian, outstrips the supply.

Where We Stand in Production

Our total food production may be about 5 percent greater than that of 1942, and 32 percent above the average for the period 1935–39. The increase will be in livestock and livestock products, the total of which

may run as much as 10 percent above 1942. Output of food crops may be 9 percent smaller than in 1942, owing to a decrease not in the acreage but in the yields. The food crop acreage is 3 percent above 1942. These facts, combined with current military, lend-lease, and civilian allocations, indicate that the civilian food supply per capita for the calendar year 1943 will be about 4 percent greater than the average for the period 1935–39, though 6 percent below the record consumption in 1941.

Total meat production for 1943 may reach an all-time high of 24 billion pounds dressed weight. This is 12 percent larger than that of 1942, and nearly 50 percent above the average for 1935–39. Though the production of lamb and mutton will be somewhat smaller than in 1942, the production of beef and veal will exceed the 1942 total by 3 percent or thereabouts, and the production of pork will be 23 percent higher.

Chicken production may reach the record total of 4 billion pounds, and egg production will probably exceed 5 billion dozen. Production of milk for human consumption will be nearly as large as it was last year, though increased use of milk in the fluid form will entail a drop of possibly 13 percent in the production of cheese and evaporated milk. Ice cream production will be down about 20 percent from 1942, but butter production may be up a little.

Supplies and Main Allocations

Other main facts in the year's production story are: Output of edible fats and oils, not counting butter, may be 10 percent above 1942 and 42 percent above 1935–39; estimates indicate a record citrus output 6 percent above 1942 and 22 percent above 1935–39; production of apples and other fresh fruits, on the other hand, has shown a decline, from late spring frosts and generally unfavorable weather; the pack of canned fruits will be about 30 percent smaller than last year's while the pack of canned juices and of dried fruits may be 54 and 13 percent greater respectively; commercial production of vegetables for the fresh market will be about 11 percent below 1942; the potato output, however, will set a record; the wheat crop is estimated at 836 million bushels, 146 million bushels below last year's large crop though 97 million bushels above the 10-year (1932–41) average; the corn crop, estimated at 3,056 million bushels, is 4 percent below 1942, but 30 percent above the 10-year (1932–41) average. The feed supply per animal unit may be considerably smaller than in the previous season, but about equal to the average of 1937–41.

In the division of this food supply we have had the following allocations: Seventy-five percent of the total for civilians in the United States; 13 percent for our own military forces; 10 percent for the lend-lease commitment; and the remaining 2 percent for shipments to our territories and for special needs. These allocations mean that United States civilians this year as compared with 1935–39 had a larger supply of pork, eggs, chickens, fluid milk, fats and oils, fresh citrus fruits, canned juices, and potatoes. They will have a smaller supply of beef and veal, lamb and mutton, fish, most dairy

products other than fluid milk, fresh, canned, and dried fruits, sugar, rice, tea, and cocoa.

Nutrition Value of Civilian Food

In nutrition-value the civilian food supply for 1943 compares favorably with the average for 1935–39. On a per capita basis the quantities of protein and of minerals and vitamins available will be higher than in the pre-war period. It is as high in some nutrients as in 1941 or 1942. Calories available will be approximately the same as in 1935–39, though about 4 percent less than in 1942. This is not proof that the diet will fully meet nutritional requirements; dietary levels from 1935–39 were far from satisfactory for the nation as a whole. It is evidence, however, that we can fight a war without reducing the national level of nutrition. As a matter of fact, the current production, along with rationing and increased buying power, allows some improvement in the nutrition situation generally, since the prevailing conditions enable more people to get a fairer share of the nutrients available. It need cause no concern that the number of calories or food-energy units available for civilians will be smaller than in recent years. This is a result chiefly of reduced consumption of sugar, and of heavy induction of the younger, more active men into the armed forces. Greater attention to food conservation, moreover, may make the caloric value of the food actually eaten about as high as it was before the war.

Why Demand Outruns Production

Prodigious compared with the record of the past, our current production is nevertheless insufficient for the demands of the war, and it is important to understand why. Harm can come either from exaggerated talk about the so-called food crisis or from easy assumptions that everything is all right. We want neither scares nor complacency, but information on which to base continued well-directed effort. It is impossible to have all the food we could use, because we need many other things as well. Our task is to get the maximum food supply consistent with balanced production of all war necessities, from rifles to battleships. The list includes most things we need in peacetime, and in the production of them industry and agriculture must share manpower and materials.

Many people suppose that the United States produced large food surpluses in the 1930's. Nothing could be less true in terms of human needs. In the pre-war years at least one-third of our people were undernourished, either because they chose food wrongly or because they did not have enough money to buy what they needed. Nutrition scientists reported that to provide a good diet for all the people in the United States would require considerably more milk, leafy green and yellow vegetables, and tomatoes and citrus fruits.

Surpluses existed before the war in terms of consumers' buying power but not in terms of consumers' needs. Farmers had to limit their production for lack of markets. There was never any lack of

human need for food; but farmers would have gone bankrupt had they tried fully to supply it at the low prices they would have had to take at that time.

Situation When War Began

Contrary to a common belief the United States was *not* producing heavily for export. It exported on the average in the 1920's and '30's only about as much food as it imported. Foreign demand for our chief farm exports, such as wheat, cotton, tobacco, pork and lard, was off tremendously. Our main food imports consisted of things like coffee and sugar, which we did not produce at all, or did not produce in sufficient amounts at home. Essentially, the difficulty was the same in the foreign market as in the home market—lack of a sufficient and ready market. Continued production of surpluses would have meant lowered prices and extensive farm distress. Our farm production consequently dropped far below our farm production capacity. Crop acreage was less during the 1930's than during the 1920's, so that when war came we had only moderate food reserves on which to draw.

Nevertheless, the pre-war years were years of rising farm efficiency. This progress created at least a potential food reserve which came in handy when the food need rose. It showed up in rising yields per acre, in increased production of meat and milk per unit of feed consumed, and in widespread soil improvement. Increased yields per acre gave us more food production in the late 1930's in spite of a slightly reduced crop acreage. Our total food production, which, as mentioned, has increased for 7 consecutive years, advanced 35 percent from 1935 to 1942. This total should be distinguished from total farm production, which includes feed crops and nonfood products. It embodies improved techniques as well as expanded acreage and livestock breeding.

Selective Crop Expansion

Our huge increase in food production since 1939 is the result, not of uniform, but of selective crop expansion developed farm by farm through careful thought and advance planning. It represents not just any kind of farm production, but the kind we need for the war. The achievement reflects the decisions and efforts of millions of farmers, expressed in planting, breeding, and feeding operations. Much shifting of crops has taken place, along with improvement and changes in crop rotations. Science has contributed significantly to the results.

Our food production has increased faster in this war than it did during the first years of World War I largely because the work has been more thoroughly planned, more highly organized, and more scientific. Farmers have aimed especially at particular kinds of farm production, notably eggs, dairy products, meats and oil crops, and they have found it necessary to vary considerably from their customary farm practices. The result is qualitatively as well as quantitatively remarkable, but the farmers are undertaking to do still better next year, 1944.

Next year the Government will ask farmers to plant 380 million acres, about 16 million acres more than in 1943, and more than in any previous year in our history. Increased emphasis will be placed on growing the right amounts of the right things in the right places. Farmers will convert more of their land to the production of the most needed crops. They have already gone far in that direction. Nevertheless, additional conversion is still possible, and in fact will be important for the duration. More acreage will be in crops such as dry beans, peas, soybeans, potatoes and peanuts. Feed crops will be increased wherever they will produce more food or feed per acre than any alternative crop.

Military Claim on the Food Supply

Let us turn now to the claims upon our food supply. One of the Government's policies is to make our armed forces the best fed fighters in the world, and it provides each soldier or sailor with almost the equivalent of 1½ civilian rations per day. The average soldier or sailor eats approximately 5¼ pounds of food as purchased per day, as compared with approximately 3¾ pounds consumed by the average civilian. Obvious reasons account for this difference. Our soldiers and sailors are vigorous young men who even as civilians probably ate more than the average civilian and who now must be kept in top physical condition. They reduce the civilian food supply by the *difference* between what they ate as civilians and what they eat now. This year something like 13 percent to 14 percent of our food production will go to our armed forces, as compared with 7.5 percent in 1942.

The kinds and quantities of food required by our armed forces depend mainly on two factors: (1) the number of men inducted and (2) the number sent abroad. Our armed forces had a total strength of about 7,000,000 at the beginning of 1943, and at the end of the year their total strength may approximate 10,800,000 men. So that the right food will always be available, the Army and Navy require at least a 90-day reserve supply for men quartered in this country, or approximately the same reserve supply required by wholesalers and retailers for the regular civilian trade. For the men abroad, however, the reserve requirement is much greater, so as to allow for the time required in transporting food and for ship sinkings and other war losses. The overseas reserve is a 9-month (273 days) supply. It includes emergency supply rations. In addition, the Army and Navy require extra emergency reserves, such as were used following our operations in North Africa and Sicily.

Our fighters require large quantities of the "protective" foods, such as meat, fats, oils, milk, and canned goods. These are the foods which are in short supply for civilians. Civilians may consequently overestimate the extent to which the requirements of the armed forces affect the total food supply. In the fiscal year 1944 our military and war service will take substantial percentages of the supply of fresh and canned meats, of canned fruits and juices, of canned vegetables, of butter and other edible fats and oils, of cheese and other dairy products, of eggs, and of canned fish. Such foods have energy, vita-

min, and mineral values. Many of them, moreover, can be dried and conveniently packed for use abroad. Soldiers and sailors in our camps at home also receive fresh milk, fruits, and vegetables, but it is impracticable to send such perishables abroad. Both in total volume, and in the animal protein and "protective" foods, the armed forces draw heavily on our food supply, and the demand will increase as the total of the armed forces rises and as the number on foreign duty grows.

The Lend-Lease Call

Then we have the lend-lease call. Food has been an important item in the lend-lease shipments from the beginning. The Lend-Lease Act became effective March 11, 1941. In 1941 the lend-lease food shipment amounted to about 2 percent of our food production; in 1942 to about 6 percent. This year it will approximate 10 percent, if we can spare that percentage after providing for the basic needs of our armed forces and our civilians. Food shortages in Russia, and the essential needs of liberated people in North Africa, Sicily, and Italy, are important factors.

This year we may send more food to Russia than to Great Britain, whereas in 1942 Great Britain was by far the largest recipient. In the period March 1941 through March 1943 our British allies received about 3½ times as much lend-lease food as did the Russians; but in the first 5 months of 1943, because of the invasion of the Ukraine, the USSR received one-third of our lend-lease food shipment. In March last, at which time the enemy held 40 percent of Russia's most productive lands, nearly one-half of our lend-lease shipments to Russia consisted of foods.

Why we send lend-lease food supplies to Great Britain and Russia needs little elaboration. Giving our allies all the food we can spare is a means of enabling them to keep their factories running, to kill our enemies, and to defend or regain territory. The United Kingdom, with 46,000,000 population in an area about the size of Oregon, has long had to depend heavily on food imports, and before the war did not produce more than 45 percent of its foodstuffs for a national dietary somewhat below that of the United States. During the war it has increased its food production materially, through the reclamation of waste acres, the expansion of dairying, and extensive gardening in back yards, in bomb craters, and in soil never before used for producing food. Our lend-lease shipments have provided some 10 percent of Britain's food supply; Canada has shipped an even larger proportion. Lend-lease shipments provided a major source of supply for Montgomery's African army.

Food Needs of Russia

In Russia the need for lend-lease foods arises not only from Russia's temporary loss of food-producing territory but from the country's tremendous concentration on the production of weapons and from its extremely high induction of manpower into the army. Russia has had to sacrifice the production of farm machinery to a much greater extent than we have. It has had to militarize most

of its economy. Millions in Russia face actual starvation. Food for the civilians has been cut to the barest minimum, with black bread the main food and meat available only on rare occasions. Our food shipments to Russia are essential to sustain Russia's soldiers and keep them fighting; in fact nearly all the food we send to Russia is for the use of the Russian army, whereas the food we send to Great Britain is for civilian as well as military use. Russia, like Great Britain, could make good use, for the common cause, of much more food than we can send; it may be a food-deficit area temporarily when the war is over.

In 1941 the enemy occupied most of the Ukraine and much of the black soil belt of Central Russia; in 1942 the Nazis overran the Don-North Caucasus area. Some of the most fertile cropland in Russia, devoted to grain, oilseeds, sugar beets, potatoes, and fibers, fell into the zone of invasion and fighting. Most of the invaded territory the Russians have reconquered. But it has suffered wholesale destruction of farm implements and livestock and also heavy loss of manpower. Some time must pass before it can be restored to full production, and the population meanwhile must have food and seed. This puts an additional burden on the rest of the Russian economy.

Food and Seed Shipments

To help meet Russia's food needs, we have shipped more than 1,300,000 tons of foodstuffs, valued at 373 million dollars, under the lend-lease arrangements. Up to June 30, 1943, our food exports to the Soviet Union amounted to over one-fifth of the total lend-lease food exports. We shipped an additional 43 million dollars worth of other agricultural products to the Soviet Union, equivalent to more than 10 percent of the total lend-lease exports; also a considerable quantity of seed of vegetables and field crops, purchased with lend-lease funds or collected by voluntary contributions. These shipments have been of material assistance to the Russian war effort. Nevertheless, the Russian civilian population is on short rations, particularly in the protective foods so important for the maintenance of health.

Lend-Lease Principle in Reverse

It should be noted that the lend-lease principle works also in reverse and provides the United States with foodstuffs from its allies in certain war areas. For example, our forces in Australia and New Zealand have received on a reciprocal lend-lease basis nearly as much beef as the United States has shipped out to all the countries that receive lend-lease foods from us. Also, our armies in the same countries have received substantial amounts of fruits and vegetables. Yet Australia and New Zealand have no superabundance of food; on the contrary, war conditions have created severe shortages there in a number of foods. The lend-lease principle applies in reverse in other ways, such as through the use of British or Russian ships for troop movements, through the repair and servicing of American ships in United Nations ports, through the building of American camps, and through the furnishing of uniforms and weapons.

Supplies for Liberated Peoples

Some food supplies for liberated peoples, who will shortly be numerous, must be reckoned among the United Nations' food responsibilities. Food for such peoples, to the extent that it can be provided, will be added power against the Axis, and a means also of building health and preventing world-wide epidemics. Besides tiding the liberated peoples over, it will be a psychological weapon meantime for people still enslaved. The knowledge that food, at least for bare necessities, awaits them as soon as the Axis no longer stands in the way, should strengthen their resistance, and hearten them for revolt. Our relief feeding is in direct contrast with the Axis program of starvation and in consequence it has important military value.

The Office of Foreign Relief and Rehabilitation Operations, which was set up in the State Department last December and subsequently merged with Foreign Economic Administration, has provided relief, for example, for the civilian population of Tunisia, and may help in similar operations in parts of Italy. Only a limited amount of so-called free relief has been necessary up to the present; the provision of supplies, and the opening up of avenues of exchange, have been more important. Frequently the provision of food, either for free distribution or for sale or exchange, is the first thing necessary in restoring food production locally.

In Tunisia the OFRRO has provided rationed supplies at reasonable prices through a system of relief stores, pending restoration of local farm production, the outlook for which is favorable. In the rest of North Africa, through programs which may shortly be no longer necessary, the agency has provided school children with milk in cooperation with the Red Cross. Programs of a relief character in which the United States participates provide only necessities but include means of production, such as seed, fertilizer, and simple agricultural implements.

Famine and Disease Under the Axis

Some idea of the need for such work can be gained from accounts of Axis procedure. Casualties of German aggression include millions of civilians, especially women and children and the aged. The younger men are dead or in forced labor. In Poland, and undoubtedly elsewhere, the Germans burn homes and villages when German-set grain quotas are not filled. Failure to deliver quotas may be followed by public executions. On the other hand, deceptive bribery may be used, as in the case of a Greek farmer who met his quota and received a hand scythe though he had been promised a new reaper. Schedules demand the delivery from Polish farms of approximately 9.6 bushels of grain per acre sown, or about two-thirds of the average yield in 1937. Owners of the larger farms must do their threshing under the eyes of German supervisors.

The disease rate is appalling in countries under the German heel. Tuberculosis is at an all-time high in Belgium; the same disease has shown a sixfold rise over pre-war years in Rotterdam. There is heavy mortality from pneumonia, influenza, and diphtheria. The nutri-

tional-deficiency ailments, such as beriberi, have increased. In reconquering Europe from the Axis, the allied nations unavoidably assume a food responsibility which in part will involve food shipments because food is indispensable in the fight against disease. Moreover, some food must be on hand in the ravaged countries so that the people may regain health and strength enough to produce more.

Shipments in Western Hemisphere

Besides meeting the requirements of our Army and Navy, and providing lend-lease foods and some relief food shipments, we send foodstuffs to our Territories and to friendly nations nearby. Such Territories as Puerto Rico, the Hawaiian Islands, and Alaska depend heavily on food from the United States and Canada.

Certain countries in Central and South America, most of them our active allies in the war, look to us for some foodstuffs, in return for which they may send us other foods or war materials such as fertilizers, rubber, and minerals. This year we expect to ship a little less than 2 percent of our food production to our Territories and our neighbor countries, and on the other hand, to import some food from them. Some normal international trade in food, and also some international food trade of an unusual character, are natural accompaniments of the war effort, not at all disadvantageous to us and yet definitely a claim to some extent on our food production.

The Civilian Claim

The biggest claim on our food supply is the civilian claim at home. It will take about 75 percent of the 1943 production; it should be remembered, too, that as the size of our armed forces increases, our civilian population is reduced. Because of food production increases, the 75 percent that will be available for civilians is about the equivalent of the average amount of food produced in this country in the years 1935 to 1939. It hasn't the same pre-war composition, but it is not deficient in essential nutrients. If the demand exceeds the supply, it is because of the tremendous growth in civilian purchasing power, which in 1943 has been estimated to exceed the purchasable goods supply by some $45,000,000,000. Total income will be in the neighborhood of 140 billion dollars, as compared with 48 billions in 1932.

With many customary commodities unobtainable, the consumer's dollar spends much time in the grocery store, though it doesn't always pass over the counter. With their current income, people would like to buy much more food than is available. This unsatisfied desire is a force over and above the war demands, and it creates false views of the total food situation.

How the Allocation System Works

Most people recognize, however, that desires should be distinguished from needs, and accept the necessity for allocating and rationing food supplies. They know that if they could buy food without restriction as long as the supply lasted, our fighters and our allies would go short. Some facts may be useful, however, as to how the allocation system works. Except for our own armed forces, which receive maximum

consideration, the American civilian comes first. Moreover, the allocation authorities have determined that in no circumstances will the total food supply be so divided that basic civilian requirements cannot be met. As evidence that the rule is in operation, we may note that in the first half of 1943 we did not fully meet the lend-lease demand in any month. In the allocation of America's food supply, the War Food Administration is the authority; it acts with the advice of boards that represent all the groups of claimants. The Army and Navy present the requirements of the armed forces, the WFA those of our civilians, the Lend-Lease Administration those of our allies, and the Office of Foreign Relief and Rehabilitation those of the liberated peoples. The Foreign Economic Administration presents requirements for trade with Central and South America and other countries.

Civilian requirements are carefully calculated by economists in WFA. Sometimes WFA asks the Army and Navy to change its estimated requirements so that civilian needs may be met. In some cases the change requested affects the total food requested; in other cases, the types of food desired. Shipments on lend-lease account may be cut down or changed from time to time, in line with supplies and other requirements. It was necessary this year, for example, to cut down the British call for cheese; on the other hand, the Russians presented an urgent request for dry peas and beans, and the allocation authorities decided the Russians needed these supplies more than American civilians did. Naturally, our ability to satisfy these claims presupposes civilian rationing, which divides our limited food supplies for the best total advantage and plays no favorites. The price-control system, discussed elsewhere in this report, plays a vital supporting role, in that it keeps essential foods within the reach of everyone. After supplies have been allocated, they must be shared. Price control plus rationing is the means.

Avoidance of Waste

One claim upon the food supply should be reduced as much as possible—the claim represented by avoidable waste. Such waste takes place daily on farms, in Victory Gardens, in the channels of food distribution, in storage places, in grocery stores, in restaurants, and in homes. It exacts a terrific toll. From 20 percent to 30 percent of the food produced in the United States never reaches the consumer, and though some of the waste involved is unavoidable, much of it is not, particularly the waste that occurs in homes and restaurants. If only one-third of the annual food waste could be avoided, we should have the equivalent of a 6 percent or 8 percent addition to our food supply, or the equivalent of the increased food production asked in 1943 over 1942.

Vigorous measures have been taken to avoid waste of food in Army and Navy camps. For example, the Quartermaster Corps has developed a new basis for issuing rations to obviate waste that resulted previously from the practice of issuing food for the number of men carried on the rolls rather than for the actual number present at meals. The new system makes allowance for the absences which can be anticipated. Moreover, the armed forces urge the individual soldier

and sailor not to waste food, though at the same time to eat all they want. Another corrective step prescribes the less popular foods on fewer occasions in the master menus. In May last after studying food-administration methods in the Navy, a civilian committee reported food waste in the Navy appeared to be less than in the average home or public institution.

Teamwork on Food Front

Effective action on the food front requires careful planning and action by the Government, vigorous effort by farmers and Victory gardeners to produce more food of the right kinds, and wholehearted cooperation on the part of every citizen. The Government must tell farmers what kinds and amounts of food the Nation needs and provide all possible help in the way of tools to do the job. In addition, it must allocate the food supply properly. Farmers and Victory gardeners have the duty of managing their resources efficiently, so that manpower, seeds, fertilizer, machinery, and other means of production will not be wasted.

Everyone has the duty to conserve food. Food processors can take extra precautions to see that every pound of food possible is preserved, canned, and packed. Food retailers and restaurant proprietors have important food-conservation tasks. Homemakers can increase the usable food supply through home canning, drying, brining, and storing.

In campaigns for united action to make food fight for freedom the Government emphasizes production, conservation, food sharing through rationing, application of nutrition principles, the substitution of plentiful for scarce foods, and observance of price ceilings. It asks for the cooperation of consumers, of professional and nonprofessional groups, and of community organizations. Community action to provide direction, inspiration, and continuity in the program is highly important, since each community has its own food problem and may have to tackle it in its own way. Underlying everything is the knowledge that as long as the war continues there will not be food enough to meet all demands and that the strain on the food supply will be greater the nearer we get to victory.

Main Essentials in Food Effort

The first and most important need is increased farm production. Accordingly, the Government is asking farmers to increase their crop acreage for 1944 and to maintain their high production of meats, dairy products, and eggs. It also hopes that an additional 2 million or more Victory Gardens will be added to the 1943 total of 20,000,000. Avoidance of waste, along with more preservation of foods through canning, drying, and other procedures, can add significantly to the food supply. Labor spent on Victory Gardens and other noncommercial gardens needs the backing of extensive home canning. Food sharing, through the rationing system, makes the food supply go farther; so does the proper cooking, serving, and storing of foods. These and other means of making food fight for freedom could add the equivalent of another 15 percent to our food supply.

FARM PRODUCTION IN 1943

Agriculture in the United States set another high record this year in total food production, for the seventh year in succession. As 1942 will long be remembered as the year of big crops, so 1943 will be remembered as a year of phenomenal livestock production.

By January 1, 1944, the number of hogs on farms will be close to 88 million, or nearly 30 percent of the total number in the world. The increase in cattle for the year may nearly equal the 4 percent increase reported last year. In sheep some decline took place. Chicks less than 3 months old on farms September 1 totaled 225,000,000, as compared with 156,000,000 on the same date in 1942, and turkey production remained well above the level of earlier years. Though the peak of milk production may be past for the present, the number of milk cows continues to increase.

Crops met the handicaps of destructive spring frosts in the South, of great floods in the Central States, and of wet weather in May which delayed planting over a wide area from New York to Iowa. Severe summer droughts occurred in a large south central and southwestern area, and in a smaller central Atlantic area. Yet aggregate crop yields per acre, for the Nation as a whole, were second only to those of 1942, and with that exception were the highest since the western prairies came under the plow.

Conditions This Year and Last

In view of the obstacles which the farmers ran up against, the accomplishment should be viewed against the background of last year's much more favorable conditions. Marvelous weather in 1942 helped to produce average yields 36 percent higher than those of the "predrought" decade of 1923–32, and 14 and 12 percent higher than the yield averages of 1940 and 1941, each of which topped previous peaks by about 1 percent. Conditions were also extremely favorable in 1942 for livestock production, especially pasture conditions. Carrying capacities of both western ranges and farm pastures were equal to what they had been before the drought years, and hay and forage production was a record.

Weather conditions this year were not so good, and farmers had to contend with shortages of machinery, tools, labor, gasoline, tires, bags, spray materials, and fencing. The year sets another high record in food production primarily because the farm people applied their skill, resourcefulness, and energy to the job as never before, and secondly, because they tackled it cooperatively on plans worked out farm by farm with Federal and State help from one end of the country to the other. Lengthened workweeks, more use of science in raising crops and livestock, and widespread sharing of scarce facilities, en-

tered into the accomplishment, which will stand permanently as a monument both to the efficiency and to the patriotism of the farmers.

Livestock production had specially favoring circumstances; in fact an equally favorable combination happens rarely. After the drought years of the early 1930's, we had good crops from 1937 through 1941, and these laid the foundation for a progressive increase in numbers of cattle, hogs, sheep, and poultry. Range grass recovered and stocks of feed accumulated. The unprecedented harvest of 1942 added greatly to the accumulated feed supply. Production of grain in 1942 totaled 156 million tons—twice the production in the drought year 1934 and equal to one-fourth of the quantity usually produced in the whole world. Total crop production was 11 percent greater than in any previous year. In consequence our stocks of grain, the highest in 20 years, increased in every State, and set the stage for maximum livestock production, the demand for which was meantime rising fast.

High Spots in 1943 Achievement

Farmers began 1943 with record numbers of livestock, record supplies of grain and hay, and record price conditions. Prices of livestock were high and rising; the inventory values of cattle, hogs, and chickens on farms averaged the highest since the Civil War.

Farmers saved 74,050,000 spring pigs, or 22 percent above the number saved in 1942 and 37 percent above the number in any previous year. They appear to be saving about 21 percent more fall pigs than in 1942. In fact, the 88 million hogs that will be on farms January 1 will overtax the feed supply.

Milk production was slightly below the record output of 1942, but about 2 percent greater than in any previous season; moreover, an increased proportion of it reached the market as whole milk. Production of sheep and lambs, though some 8 percent below the 2,313 million pounds produced in 1942, should exceed the output for any year prior to 1941.

Production of livestock and poultry may exceed 50 billion pounds live weight. This is 12 percent greater than the production of 1942, and 27 percent greater than in any previous year. Output of eggs in the first 11 months of the year was 12 percent above that of 1942, and 43 percent greater than the average during the corresponding months in the previous 10 years. On a meat-equivalent basis, the production of meat, milk, cream, and eggs in 1943 will run 25 percent above the production in any year previous to 1941.

Growing Conditions Only Average

Crop production dropped about 6 percent below the tremendous harvest of 1942. This was the result of poorer growing conditions. Acreage of 52 principal crops was larger than in the previous year—close to 361,000,000 acres, or about 3 percent above that in 1942 and only 4 percent below the peak that was reached in 1932, before the drought years. The weather in 1943 was by no means uniformly favorable, as it was in nearly all the States last year; it was no better than the long-term average, though most of the Great Plains area had a carry-over of good subsoil moisture.

Opening with repeated late frosts, which severely hurt early vegetables in the South and reduced fruit production rather generally east of the Rockies, the season ran into a period of torrential rains and extensive floods in the Mississippi Valley. It is therefore remarkable that crop production held up as well as it did. Credit for the fine result belongs chiefly to the farmers, who changed their plans and adapted their cultural practices to suit the special conditions. Replanting in flood-damaged areas, for example, called frequently for different crops.

Crop Production in Retrospect

It will help us to appraise the showing if we glance back. In the decade 1923–32 crop production in this country was fairly typical; it was neither boosted nor depressed by very unusual weather conditions. Accordingly, the crop reporting service takes the production of that period as 100 percent and measures subsequent changes against it. Production in the drought year 1934, for example, dropped to 72 percent of the average, or to the lowest point since the droughts of 1890–95. In 1936, another year of excessive drought, the output was 80 percent of the 1923–32 base.

Since then the droughts that have occurred have been local rather than general, and crop yields have risen in line with a tendency which the drought years concealed. In consequence crop production has been maintained at levels seldom approached before.

Our huge cotton crop in 1937 helped to boost the crop production of that year to 112 percent of the predrought average. In the succeeding 4 years the index ranged from 103 in 1939 to 110 in 1941. The all-time crop-production record of 1942 was 126 percent of the 1923–32 average.

Comparison With "Predrought" Years

Against this background, the decline this year was not unexpected; the outstanding fact is that in spite of the difficulties they encountered farmers realized a crop production that was still 117 percent of the predrought average. It should be remembered that the wet weather of May interfered seriously with normal planting operations not only in the States that reported actual flood damage, but also in the eastern Corn Belt and in Michigan and New York. The opposite hazard also developed. As the season advanced, drought conditions affected large areas. Summer drought conditions developed in the Southwest, and spread to nearly the whole South.

Limited areas experienced critical drought conditions. Extremely dry weather centered in northern Arkansas and eastern Oklahoma and extended into western Tennessee, northwestern Mississippi, southern Missouri, and northeastern Texas. Another drought area, where crop losses were severe, extended from south-central Pennsylvania and central New Jersey southward across Delaware and Maryland to central Virginia. By late summer and early fall the drought had extended into the southern part of the Great Plains, where it damaged sorghums and other late crops and discouraged the seeding of winter wheat.

Main Crops Not Much Hurt; Acreage Affected

Fortunately, the main crops of the principal agricultural regions escaped serious damage, except in a few areas. Most of the spring wheat region had more than the usual summer rainfall, and most of the West had plenty of irrigation water. In the Corn Belt warm weather and timely summer rains went far to offset the delay in planting; while in the eastern Cotton Belt dry weather was beneficial rather than hurtful to cotton. Weather conditions and other factors limited the acreage planted or grown, though, as previously mentioned, it rose above the 1942 level.

Floods and wet weather in May kept perhaps a million acres out of cultivation. The fact that we had record stocks of wheat on hand tended to limit the acreage of winter wheat in the semi-arid regions. Farmers with land suitable only for cotton reflected that we had a year's supply on hand. Shortages of tractors and other equipment prevented many farmers from increasing their tilled acreage, and the exodus of manpower from the farms into the armed forces and into war industries threw an extra burden on the older farm men and on the women and boys. It was not practicable, in view of the need for beef and milk, to substitute crops for pastures extensively.

High Yields Maintained

Crop reports indiicate that the yields per acre may average 9 percent below those of 1942. They will be slightly higher, however, than those of any previous year, and about 24 percent higher than the yields of the 1923–32 predrought period. As already noted, the decline from 1942 reflects the change from extremely favorable to near-average weather. The increase over the yields of earlier periods is the result chiefly of improved methods of production.

Agricultural research and education have benefited one crop after another in the last 20 years, and current returns give farmers an increased reason to put agricultural science into practice. Special importance attaches to the use of certified seed, better varieties, improved cultural practices, fertilizers, insect and disease controls, and up-to-date equipment. Comparisons indicate that the upward trend in yields from factors other than the weather has been more than 1 percent a year. As compared with the yields of the predrought (1923–32 period), the yields of 1943 bear striking witness to the advance of farm technology.

Size and Composition of Output

Closely adjusted by and large to the Nation's requirements under war conditions, the year's production was nevertheless deficient in some lines. For example, it was substantially below the quantities desired of fruits and vegetables. Farmers harvested record quantities of peanuts, flaxseed, peas, beans, potatoes, rice, and soybeans. Tonnages of hay and feed grain harvested have been exceeded only in a few exceptionally favorable seasons. Wheat, cotton, and tobacco, of which crops we still had considerable supplies on hand, were produced in about the usual volume.

Good crops of oranges and grapefruit promised partially to offset decreased production of deciduous fruits. Late frosts and labor shortages reduced the production of vegetables grown commercially for the fresh market, but Victory Gardens provided many families with more than their usual supply. Local droughts prevented full achievement of the goals for canning and processing vegetables. Production of such vegetables, though 12 percent lower than in 1942, was still nearly 6 percent above the production in earlier years.

Considering all crops, the production answered to the wartime need, except in areas where weather conditions interfered. In crops specially required to offset loss of customary imports, the output by comparison with pre-war levels was huge. Soybean production, for example, exceeded the record showing last year, and the acreage threshed was nearly four times the average for the previous 10 years.

Feed-Grain Production

Our corn crop, which is usually 55 to 60 percent of our total grain, suffered from late planting, local droughts, and early frosts but came through with a yield now estimated at 32.5 bushels, a mark exceeded only by the ton-per-acre (35.2-bushel) yield secured in 1942. More than half the corn acreage and nearly four-fifths of the acreage in the main Corn Belt States was planted with hybrid seed, which was not used on more than 0.1 percent of the acreage prior to 10 years ago. This improved seed appears to have raised the yield in the United States about 5 bushels per acre above what would have been expected under the same conditions if open-pollinated corn had been used.

The acreage of corn (estimated at 94,790,000) was about average, but because of the high yield the production will probably exceed 3 billion bushels, a level previously exceeded only by the crops of 1920 and 1942. Estimates show 1,143,867,000 bushels of oats and 332,187,000 bushels of barley produced—together, about the same as the average during the last half-dozen years. Sorghums for grain were planted on a large acreage but suffered from drought in the Southwest.

Total feed-grain production is nearly 115 million tons—6 percent below the production in 1942, but above the production in any earlier years except 1920. This large production, plus the near-record supply of feed grains on farms when this year's harvest began, gave a total supply on farms only about 6 percent below the enormous supply in 1942. Units of livestock to be fed next winter, however, will be about 10 percent greater than in the winter of 1942–43; there will be slightly less feed grain per animal than last year, but about the same as in the average year of the 1937–41 period.

The Food Grains

Wheat production in 1943 was 836,000,000 bushels, about an average crop following two very large crops. Winter wheat was planted on the smallest acreage since 1914 and suffered locally from drought. Spring wheat, planted on a rather small acreage, was favored by timely rains in the principal producing States and by the increased use of disease-resistant varieties. As a result the yield was 18.5 bushels

per acre, much below the exceptional yield of 20.2 bushels harvested in 1942 but substantially higher than the yield in any previous year. Rice, grown on an acreage about 50 percent larger than in pre-war years, produced 70,025,000 bushels. This is about 5 million bushels more than were produced in 1942 and 16 million more than in any previous season. Rye and buckwheat were about average crops.

Production estimates of the various grains add up to a total of 143 million tons. This is less than the 155 million tons produced in 1942, and less than the production in 1920, but it is the third largest grain crop this country has produced. It represents more than a ton per capita for our entire population, or about four times the average per capita production in the rest of the world. It averages nearly 14 tons of grain produced per person employed on our farms. Few other countries have ever attained such a standard.

Oil Crops and Cotton

The area of soybeans threshed is expected to be about 10.8 million acres, 7 percent greater than in 1942 and nearly 4 times the average for the previous 10 years. The acreages in flaxseed and dry peas were each about 3 times the 10-year 1932–41 average, the peanut acreage was 2½ times the average, and the bean acreage nearly 1½ times average. The acreage in the 5 crops was nearly 24,000,000 acres, or nearly 3 times the 1932–41 average.

The peanut acreage was expanded on some less productive land and the crop was reduced by drought, but the other four crops are giving excellent yields. Our soybean crop, exclusive of seed requirements, should be about 5.4 million tons, and about one-third of this is protein. If the meal left after extraction of the oil were utilized in food products instead of mostly for feed, it would supply as much protein as 60 million people consume in a year.

Cotton production is estimated at 11,478,000 bales, about an average crop. But we have a large carry-over from last year. Only 21,874,000 acres are being picked, the smallest acreage since 1895. The yield per acre, on the other hand, is the fourth largest on record and has been exceeded only in 1937, 1940, and 1942. Summer rainfall was below normal in practically all of the cotton-growing States. In most of the eastern Cotton Belt this limited the damage from the boll weevil without seriously checking the growth of the plants. In an area including most of Oklahoma and parts of Arkansas and Texas, the summer rainfall was less than half the normal, and yields per acre there are below average. The yield in the entire Belt is estimated at 252 pounds of lint cotton per acre, as compared with 272 pounds last year and an average of 217 pounds during the previous 10 years.

Hay Above Average; Potatoes a Record

Hay production in 1943 will be nearly 100 million tons, about 6 million tons less than in 1942 but above the production in other years. The quality is better than that of hay saved last year and will be sufficient to provide the usual quantity per head for the increased number of livestock, without reducing reserves below normal next spring.

Potato production rose 37 million bushels higher than in any previous year. The Government requested a large production, and growers increased the acreage 23 percent. Production will be about 465 million bushels. The yield at 139.6 bushels per acre will exceed the record yield of 136.9 bushels per acre produced last season. This accomplishment should be contrasted with the yields from 1870 to 1900, which averaged 83 bushels. The crop of 1904 was the first to yield above 101 bushels per acre. It was 1924 before the 120 bushel mark was reached, and 1940 before the yield exceeded 130 bushels per acre.

VICTORY GARDEN PROGRAM

The call for Victory Gardens in 1943 has met with a hearty response the country over. Our people have taken seriously the request that they should produce garden stuff for home use and thereby release food for our armed forces and our allies. The goal of 18,000,000 Victory Gardens set for 1943 has been exceeded by at least 2,000,000. Victory Gardens dot the American landscape on farms, in rural towns, in back yards and on vacant lots in all our cities. Moreover, Victory gardeners by and large have been successful.

It is estimated that the Victory Gardens will produce something like 8 million tons of food in 1943. Pantry and storage shelves in many farm, town and city homes are full of jars and cans of home-canned tomatoes, string beans, peas, corn, and other vegetables yielded by the Victory Gardens. Something like 7½ million farm and rural families produced and preserved the major part of their winter supply of vegetables and fruits, and many urban families did considerable home canning and preserving. For the 4–H clubs, the Victory Gardens were one of the most important projects of the year. These clubs did great service in caring for such gardens and helped to produce much of the family food supply.

Tremendous interest in gardening brought calls for information that exceeded all expectations. Over 3 million copies of the Department's publication on Victory Gardens were distributed. The State colleges and extension services helped to meet the demand for garden information. The California Extension Service, for example, sent out more than a million pieces of literature. The Iowa Extension Service sent out more than 400,000 copies of one garden circular.

Newspapers gave the program vigorous support. They encouraged people to have Victory Gardens and to carry out official recommendations and programs.

Many newspapers offered useful information daily on gardening, based largely on Federal and State recommendations. Some promoted Victory Garden contests, with notable results. Radio chains, comic strips, radio commentators, feature artists, and industrial concerns kept the Victory Garden idea constantly before the public.

The 1943 Victory Garden program recommended by the Department was as follows:

1. Every farm, where climate and water supplies permit, should grow all the vegetables needed for the family's entire year's supply in fresh and processed form.

2. All town and suburban home owners who have sufficient open, sunny space and fertile ground should likewise produce as much as possible of the family's yearly vegetable supply, especially green and leafy vegetables, tomatoes, and yellow vegetables. The larger the home lot the better for this purpose. Though every bit of vegetable produce grown at home will help, the earnest gardeners, especially those who tried their wings last year, will not be content with too small a plot.

3. In order to have larger garden plots than the home yard can provide, many Victory gardeners will seek garden space in a Victory community or allotment garden accessible by bus, streetcar or bicycle, where, on individual plots 30×50, or 50×100 feet or larger, they can grow more of the needed vegetables.

4. On farms and on many suburban homesteads people should plant strawberries, bush fruits, grapes, and certain tree fruits so that they may have more adequate supplies of these desirable foods.

5. In many towns and rural schools, the school garden effort should be directed specifically to growing large supplies of vegetables for school-lunch purposes.

6. Not one bit of garden produce should be allowed to go to waste. All surpluses from home gardens, or, where available, local market surpluses of good quality vegetables and fruits should be canned or otherwise preserved for use in homes, in school lunches, or for welfare purposes.

Program Widely Publicized

This program received wide circulation in the press and through educational agencies and brought an excellent general response, and many thousands of gardens showed large plantings of green and leafy vegetables, tomatoes, and yellow vegetables. Public attention had evidently been called effectively to the virtues of these vegetables in supplying needed protective vitamins and minerals. Especially significant was the development in cities of community or allotment gardens which gave many families an opportunity to have Victory Gardens on plots 25×25 feet, 30×40 feet, or even larger, on vacant lots, or on undeveloped real estate properties. Sometimes 15 to 20 plots were located on one large vacant lot. Chicago has one area in which over 1,300 garden plots were tended. In Milwaukee, one area of 22 acres was laid out in 220 plots, one-tenth of an acre each. In some cities the park board supplemented the help of local garden leaders and helped Victory gardeners by plowing up vacant-lot areas and preparing the ground. In Denver the park board manured, plowed, and irrigated a large area during the season at a nominal charge of $5 per plot.

Community Victory Gardens produced benefits in addition to the vegetables grown thereon. Often they became community centers where neighborhood groups met to discuss their experiences and to exchange information on gardening. They served also as social centers, where Victory gardeners served picnic lunches and became better acquainted as neighbors. Probably community gardens will be largely increased in number next year. Thousands of city people have caught the idea and want to try it.

Many railroad companies and large industrial concerns have enabled their employees to have Victory Gardens. One railroad has over 3,000 persons gardening along its right-of-way. Many large corporations have conducted advertising campaigns to encourage Victory gardening. Some of them have distributed attractive Victory Garden circulars.

Role of Volunteer Leaders

The success of the Victory Gardens in 1943 resulted largely from volunteer help and services given by local leaders who assisted gardeners to find plots and instructed them in preparing the ground and in seeding and cultivating the crops. In the rural areas neighborhood

leaders and extension agents gave instructions and services in developing and cultivating farm and rural home gardens. Neighborhood leaders in Oregon, for example, reached 70,000 rural homes with information on Victory Gardens and family home food production.

In short, the Victory Garden program of 1943 was remarkably successful. Millions of victory gardeners, in their back yards, on communuity and factory plots, in suburban and home areas, and on our farms added substantially to our food supply. Besides helping themselves, they helped the country and its allies to the extent to which their efforts released food for direct war needs.

GOALS FOR 1944

In developing the production-goals program for 1944 the War Food Administration cooperated closely with the States and with individual farmers through Federal and State agencies. It did not figure out objectives in Washington and hand them out ready-made but presented tentative proposals for analysis and discussion at meetings held in all the States. The starting point was work done by supply-estimate committees of the Federal Government. These committees calculated the production need for basic crops as shaped broadly by the food requests from some 41 claimant agencies—civilian, army, navy, lend-lease, and others. Checked against supplies on hand, the requests indicated, by commodities or groups of commodities, what quantities it will be necessary to produce in 1944.

These over-all estimates, when taken up for analysis and discussion at the meetings in the several States, served to elicit State opinion as to production possibilities. Representatives of both Federal and State agencies participated in the discussions. The viewpoint of individual farmers came in through the contacts which agricultural-agency representatives maintain continually with the farm people. It should be noted that many of the participants in the discussions were farmers themselves, particularly the chairmen of the State Agricultural War Boards.

The next step was acceptance by the State people of goals for their States.

Final integration of the State goals into one set of goals for the Nation was the end result of a cooperative process that covered the entire production field.

Goals call for the largest crop acreage in our history, along with maintained high production of meats, dairy products, and eggs. Farmers, after learning of the needs for greater output, have undertaken to plant about 380 million acres for harvest in 1944. This compares with 364 million acres planted in 1942. Largest increases will be in the crops that furnish food for direct human consumption, such as wheat, soybeans, peanuts, dry beans and peas, and fresh and processed vegetables.

In the livestock industries the problem is to balance the output with the available feed supplies, our reserves of which have been largely used up. It was feasible this year for livestock raisers to feed their livestock heavily, so as to maximize production of meat, dairy, and poultry products. In 1944 farmers will have to resort to more normal methods of feeding, since the supply of feed available per animal unit is smaller.

Livestock and Dairy Objectives

This should not cause any decrease in the amount of meats available during the current feeding year. As announced in September, the support price for hogs for the period October 1, 1944, to March

31, 1945, will be somewhat lower than it is now. The purpose of the reduction is to encourage farmers to market more livestock this year, rather than to hold them over for heavier feeding. Other steps by WFA will facilitate proper allocation of feed supplies among the various kinds of livestock, and WFA will urge the military services to stock-pile meat during the heavy slaughter run. The 1944 goals, set by State War Boards, for livestock slaughter total 33.7 million cattle and calves, 22 million sheep and lambs, and 104 million hogs. Output of meat from this suggested slaughter would be about 26.2 billion pounds, or about 5 billion pounds above the indicated production for 1943.

In milk the desired total production for 1944 is 122 billion pounds, as compared with an indicated production of 118 billion pounds this year. This production, farmers say, can be obtained from the number of milk cows now on farms, if dairymen have assistance in getting feed supplies and also some increase in returns for fluid milk during the fall and winter seasons. Steps have been taken to assist dairymen in feed-deficit areas to obtain supplies of hay at reasonable prices, and the Government is also bringing grain from Canada into the United States. Nevertheless the dairy goal, which represents an increase over 1943 of about 3 percent in production and of nearly 10 percent in whole-milk deliveries, will be one of the hardest goals to reach. It is also one of the most important.

Fresh and Processed Vegetables

Increases undertaken by the farmers in the production of both fresh and processed vegetables, though very large, will probably not be adequate for civilian as well as military needs. The requirements indicate a need for an 18-percent increase over 1942 in the commercial vegetable crop for the fresh market, and for a 40-percent increase over 1942 in vegetables for processing. Analyses of production capacity indicate that the acreage of commercial truck crops for the fresh market can be increased 7 percent over 1942 and the acreage for processing 8 percent. The goal for the commercial truck-crop acreage for the fresh market is 10 percent over 1943, and for processing 6 percent higher. This is about in line with the indicated production capacity. Considerable increases will probably take place also in market gardens and Victory Gardens.

Other Crop Goals

Other major points in the program include the production of 5 billion dozen eggs; some decrease in the production of poultry meat; an increase in the acreage of tobacco; adequate seed production of legumes and grasses; a slight increase above 1942 in cotton acreage, along with some shifts among and within States to increase the production of the higher grades and the medium and longer staples; sugarcane production for sugar and seed, on 335,000 acres and sugar-beet planting on 900,000 acres; an increase of about 5 percent over 1943 in the corn acreage, with no increases in the acreage of the other feed grains; wheat planting on 68 million acres, and further increases in soybeans and peanuts.

Price and Allocation Problems

It will be necessary, in order to obtain the production desired, to make certain adjustments in the support prices for various commodities. As indicated in another section of this report, the general level of farm prices is fairly adequate, but added risks and costs must be covered in some farm commodities. The War Food Administration has recommended that the funds available to the Commodity Credit Corporation should be increased so that the powers of the Corporation can be used more fully in stimulating needed farm production, and simultaneously in stabilizing consumer prices. Attainment of the 1944 goals will also require an increase over 1943 in the number of farm workers, estimated at about 3 percent, along with additional farm machinery and equipment.

As the counterpart of the production program, WFA is now making allocations of all our important foods on a quarterly basis, in the manner described elsewhere in this report. Each claimant agency provides a break-down of its requirements, and also considers possible adjustments and substitutions. It is of course impossible to achieve a perfect balance in each line separately between supplies and requirements, but the prevailing cooperative system of adjustments and substitutions effects a much better total balance than would be possible otherwise. The proof, already mentioned, is that necessary civilian requirements have been met up to the present without serious conflict with noncivilian needs. With average weather in 1944, the civilian food supply will again compare favorably with pre-war supplies. After providing for military and lend-lease needs, we shall still have a sufficient amount of good wholesome food, though civilians may not be able to buy all they want of every kind.

OUR WARTIME FARM EXPANSION

Changes brought about by the war in our agricultural production have been so numerous and extensive that it may be useful to sum them up. They have included both increases and shifts in many crops. The outbreak of the war in 1939 curtailed the demand for some products, but increased it for others. In 1940 our defense program got under way; simultaneously we increased our exports of munitions to Great Britain and other allied countries. These activities added greatly to the home demand for agricultural products. Approval of the Lend-Lease Act in March 1941 revived the export movement. Soon the demand for agricultural commodities became so strong that the Secretary of Agriculture announced a Food-for-Defense program and offered price supports for hogs, chickens, eggs, dairy products, and other specially needed products.

Among the urgent needs after Pearl Harbor was more domestic production of fats and oils to replace interrupted imports. More production of dairy products, eggs, pork, and lard for both domestic and lend-lease uses came high on the list, together with increased production of feedstuffs to support the necessary livestock. Our stocks of wheat and cotton were large, and it appeared some agricultural manpower and other resources could usefully be diverted from these to other crops. On the whole, at this time, our agriculture was in a fair position to contribute materially and promptly to the wartime demand. Under the stimulus of price advances, our farms brought latent resources into use and responded to the constantly increasing need with a constantly increasing output. Certain obstacles developed. Steady losses of manpower in particular curtailed farm production resources, and farm equipment became scarcer. Nevertheless, the farmers turned out crops above all previous records. Farm production, which had been at an all-time high in 1939, went still higher successively in 1940, 1941, and 1942.

Changed Crop Pattern

Moreover, the farmers have produced these satisfactory results in a crop pattern very different from that of the pre-war years. They have changed production over as well as up. In the last 2 years, for example, the area of 52 crops planted or grown has increased from 349 to nearly 364 million acres. Simultaneously, the area planted to two of the most important crops, namely wheat and cotton, has declined. On the other hand, the acreage of soybeans and peanuts has more than doubled, and production of feedstuffs has expanded. The corn acreage has increased moderately, though corn has come into increased competition with soybeans.

The area of other feed grains and also that of hay has increased, partly in a shift from wheat and cotton, with the result that we now have about 10 percent more acreage in such crops than we had in

1939. Changes since 1929 emphasize still more strongly the significance of these crop shifts. For example, the acreage of wheat and cotton in 1929 was 44 percent of the total crop acreage, whereas in 1942 it was only 35 percent.

The decline in the acreage of wheat and cotton does not imply that these crops have a relatively unimportant contribution to make to the war effort. On the contrary, wheat and cotton are vital war crops. But when the war began we had large stocks of them on hand and conversely marked shortages of other essential farm commodities. Temporarily, we could draw on wheat and cotton reserves. In many farming areas, however, the production of wheat and cotton is the best major use that can be made of the available resources. Wheat is not only a leading food crop with an immense potential relief role ahead of it, but also an important source of feed for livestock, while cotton fiber provides many industrial and war materials as well as clothing, and cotton seed contributes greatly to the supply of oil and feed. The War Food Administration has asked farmers to increase their wheat acreage considerably in 1944 and has lifted the cotton marketing quotas.

Expansion With Redirection of Farming

Largely, the war reverses the agricultural policy dictated by the great depression, and emphasizes expansion combined with redirection of the agricultural effort. Our total crop acreage has increased since 1939 approximately 18 million acres. In addition, yields per acre have increased, mainly as a result of favorable weather conditions but partly as a result also of improved farm practices. Hence the percentage increase in production has exceeded the percentage increase in the acreage. The Department believes the call for agricultural expansion will continue after the war stops, at least for a few years. It assumes that serious efforts will be made, both here and in other countries, to maintain full employment, so that a normal commercial demand for agricultural products will develop when the world-relief demand tapers off. Agricultural expansion continues meanwhile, with the support of Federal guarantees against post-war price recessions.

In connection with the production of domestic oil-bearing crops, the statistics deserve notice. The increase has been tremendous. In 1938 our area of oil-bearing crops, flaxseed, peanuts, and soybeans aggregated 5.6 million acres. It had jumped by 1941 to 11 million acres. In 1942 the harvested acreage rose to 18.6 million acres, and the acreage for harvest this year may run to approximately 22.2 million acres. In total the oil-bearing crops now comprise about 6.2 percent of the total crop acreage, as compared with only 2.5 percent in 1939. Though we have not yet fully overcome the war-caused shortage of fats and oils, our position is vastly more favorable than it was 2 years ago. Fear of a critical shortage has passed.

Changing Position of the Grains

In the 1942–43 crop year, for the first time since 1937–38, the disappearance exceeded the production of wheat in the United States.

This contrast with the position in the intervening years reflected an increased demand for wheat for the feeding of livestock, and also considerable use of wheat in the production of alcohol. On July 1, 1942, our carry-over of wheat reached a record high level of 632 million bushels. It dropped this year to about 618 million bushels. Big reductions will come in the 1943–44 crop year. Current and prospective increased demands, along with estimates of possible world-relief requirements, have warranted the removal of wheat-marketing quotas and acreage allotments and the fixing of a wheat-acreage goal of 68 million acres for 1944, or 14 million acres more than the acreage planted this year.

Expansion is likewise the rule for feed crops. Livestock numbers have increased so greatly that the disappearance of corn will exceed the production for the 1942–43 season, though the corn crop of 1942 touched the record level of 3,175 million bushels. The corn goal for 1943 called for the planting of 100 million acres, and corn acreage allotments had been removed. Farmers did not quite realize the goal; yet the plantings were 6 percent over those of 1942.

It should be remembered that the war crop program emphasizes other crops also, some of which compete with feed crops for acreage, labor, and machinery. Great importance attaches, for example, to dry edible beans and peas, potatoes, sweetpotatoes, soybeans, and peanuts, and many truck crops. The capacity of the farm to produce feed has become an important limiting factor in livestock production.

Livestock Increase Phenomenal

Livestock production has been increased with astonishing rapidity since the war began, in response to price-stimulus and appeals that emphasize its great importance. As already mentioned, the products most needed for military and lend-lease use include lard, pork, eggs, and dairy products. Hog production, which responds more readily than most other lines to increased demand, has increased about 50 percent. It is impossible rapidly to increase the number of cows on farms, but such increase in the number as is possible combined with heavier and better feeding can substantially increase the dairy production. The output this year is about 12 percent above 1939. Beef production too has increased, while the production of sheep and goats has declined moderately. Cattle numbers are at record levels. Cattle marketings have been relatively smaller because producers have been building up their herds. Very heavy cattle marketings can be expected from now on. Poultry production has jumped greatly both in eggs and in poultry meats.

Certain features of the hog situation merit special notice. When the war began, hog prices were declining and the number of hogs on farms was the largest since 1933. Accordingly, in 1940, farmers reduced the number of hogs on farms. The Department foresaw, however, that greater hog production would be needed and urged an increase.

In April 1941 it announced a hog-price support program; by this time, moreover, an increased demand for hogs had caused the price

level to rise. Farmers raised about 80 million pigs in 1940, 85 million in 1941, and 105 million in 1942. This year the production may exceed 127 million, and the number of hogs on farms will be at an all-time high. By the end of 1943 it may exceed 80 million head, as compared with the previous high level of 69 million in 1923. Moreover, hogs are being fed to exceptionally heavy weights; in fact, to weights above the level justified by the feed supply. The average runs above 250 pounds. In the 1939–40 season the average was 234 pounds. As a result of the increase in hog numbers and in the average live weight for slaughter, the production of pork in 1943 may exceed 12 billion pounds dressed weight. The comparable figure for 1942 was 10,642 million pounds; for 1939 it was 8,600 million pounds.

Problems in Dairy Expansion

Expansion of dairying, the result of an increase of about 13 percent over 1939 in cow numbers plus increased production per cow, lifted milk production in 1942 to a record level of more than 119 billion pounds. Compared with the increase in hog production, however, the dairy gain was small, and moreover could not be maintained in 1943.

Since 1939 the number of milk cows on farms has increased from 24,600,000 to 26,900,000 head, and average feeding practice has improved; but loss of labor from the dairy farms, some reduction in supplies of feedstuffs, and the fact that pasture conditions are not as good as they were a year ago, create serious difficulties for dairymen. It should be observed, too, that the current relatively high price of hogs encourages the feeding of corn to hogs in preference to the shipment of it to dairy regions and other corn-deficit areas, and in some areas encourages the feeding of skim milk to hogs, rather than the selling of whole milk for making skim-milk powder in addition to butter.

Along with the expansion of dairying it has been necessary to provide increased facilities for converting milk into the products most needed, especially cheese and concentrated milk. The Department has offered necessary price supports and encouraged the milk-processing industry in other ways. It took action early in 1941 to encourage greater production of cheese and subsequently endeavored to improve conditions for the production of condensed, evaporated, and dried milk. In both cheese and concentrated milk the output has risen more than 50 percent above that in 1939; production of butter has remained about the same. It seems likely that the output of cheese and concentrated milk may drop to some extent this year and allow more fluid-milk consumption.

Civilians are consuming more milk and cream on an average than they did before the war. The belief in some quarters that food production has not kept pace with other production has complete refutation in the single example of the dairy industry, which has provided immense quantities of milk products for shipment overseas and at the same time fully maintained the supply of fluid whole milk for civilian consumption.

Poultry Expansion Enormous

Further evidence of agriculture's vigor and responsiveness to the war emergency appears in the story of poultry production, the details of which make a record hard to excel. Even with full allowance for the fact that increase can naturally be more rapid in poultry than in other livestock, the figures are surprising. Since 1939 the number of chickens on farms has increased more than 30 percent, and the production of chickens has increased more than 60 percent. Egg production has increased about 40 percent, with a building-up of poultry flocks which promises continued expansion in egg production.

Phenomenal production of the poultry industry, both on farms and in commercial poultry plants, has proved vital in meeting the demands of domestic consumers for meat and in releasing other meats for shipment abroad. Eggs from the United States have been particularly useful to Great Britain, whose supply of protein foods suffered heavy depletion when the Nazi machine rolled over western Europe.

Food Production in Two Wars

Our food production in World War II has increased considerably more than it did in the corresponding years of World War I. On a per capita basis the output was about the same in the first year of both world wars; namely, about 5 percent above the average for the base period—1935–39. In 1915 the production rose 3 percent but in 1916 and 1917 it declined because of crop failures. In 1918, however, the per capita food production increased 9 percent over that of the previous year, and established a record that lasted until 1941. In World War II the food-production story is much more striking. From the 1939 level it increased on a per capita basis 4 percent in 1940, 3 percent in 1941, and another 8 percent in 1942. It is expected to show a further increase of 3 percent in 1943.

Our position, to be sure, was more favorable this time. Three seasons of good weather preceded the outbreak of World War II, and built up large reserves of feed grains. Moreover, the period between the wars saw great improvement in farm machinery and farm practices. Also, the soil benefited from Nation-wide conservation measures. Transportation problems were less difficult in the early years of the present war. These advantages were offset only partially by shortages of farm machinery and farm labor.

It should be noted that the food problems were radically different in the two wars. In World War I chief shortages were in wheat, sugar, and meats (chiefly pork). Severe shortages of sugar and wheat developed, partly as a result of the rival blockades, and in the case of wheat partly as a result of short world supplies. In the present war, on the other hand, wheat for food has not been a problem and the sugar situation has not been as critical. Overseas demands have been relatively greater for meats, eggs, dairy products, fruits, and certain vegetables. Loss of imports from the Pacific areas has necessitated greatly increased production of oil-bearing crops for both domestic and export uses.

Food, Livestock, and Food Crops

In both periods the production per capita of food livestock held up better than production of food crops. Food livestock production in 1918 was 10 percent greater than in 1914. In this war, between 1939 and 1942 the per capita food livestock production increased 15 percent and this year will show another 7 percent gain. Production of food crops on a per capita basis in the World War I period showed a slight decline. It reached a near record level in 1915, but was substantially lower in 1916 and 1917. In 1918 it was 4 percent below 1914. In the present war the per capita production of food crops increased 14 percent between 1939 and 1942, or from 104 to 119 percent of the 1935–39 base. The production this year is expected to be 107 percent of the 1935–39 base.

Agricultural food production for sale and farm home consumption in World War I and World War II

Index numbers (1935–39=100)

Year	Production			United States population [1]	Per capita production [2]		
	Food crops	Food livestock	Total		Food crops	Food livestock	Total
1910–14 average	75	79	78	74	101	107	106
1914	88	78	81	77	114	101	105
1915	92	82	84	78	118	105	108
1916	70	84	81	79	89	106	103
1917	75	84	82	80	94	105	102
1918	89	90	90	81	110	111	111
1935–39 average	100	100	100	100	100	100	100
1939	105	106	106	101	104	105	105
1940	109	112	111	102	107	110	109
1941	116	115	115	103	113	112	112
1942	124	126	126	104	119	121	121
1943 [3]	113	138	132	106	107	130	125

[1] Population on July 1.
[2] Index of production divided by index of United States population.
[3] Preliminary.

PRICE STABILIZATION PROBLEM

The general outline of our national program for stabilizing prices of food, preventing inflation, and at the same time encouraging production is simple, although the technical details and administrative actions are numerous and complicated. It involves Government activities on many fronts simultaneously. Every business, every industry and commodity group or organization, in fact every citizen is necessarily interested and vitally affected. Success in the program depends greatly on the extent to which farmers, processors, distributors, and consumers understand and support it.

Many agencies have to take part in the work, since it affects all branches and all parts of the national economy, from the sources of production on the land to the homes, industries, Army camps, naval establishments, and lend-lease outlets that receive and consume the goods. Opposite requirements have to be harmonized, such as the necessity on the one hand to support prices for the sake of getting essential supplies and on the other hand to hold down the cost of living. Hence opposite views must be reconciled as much as possible.

Support prices to farmers and ceiling prices to consumers have to be kept in balance through techniques that involve rationing, vigilance against black markets, purchase-and-sales operations, subsidies occasionally, and close attention to a myriad of details in both production and distribution. Tax policy, savings, credit control, and wage stabilization enter into the program, in a combination of mandatory and permissive procedures. It is becoming harder to see the forest for the trees—harder to see and do those things which are in the national interest since they so often conflict with the immediate short-time interest of the individual or the group. Yet we must try to see the problem as a whole.

The shift from a largely automatic to a largely controlled price economy exposes everyone to annoyances, with offsetting benefits which are not individual but general or collective. The annoyances come first to the notice of the citizen; he sees the compensations only later when he ponders things that don't show on the surface—when he considers facts that he cannot personally observe.

False Views of War Economy

Tests that the average citizen applies in peacetime give misleading views of the war economy. What happens to prices, for example, no longer tells him what happens to supplies. On the contrary the wartime price level may be comparatively stable in the face of skyrocketing consumption. How much money he receives may only faintly

indicate what he can expect to buy. Visits to stores with some empty shelves may make him think farmers have not done their best; conversely, the sight of laden ships off for the war fronts may give him the impression that the United States has a boundless food pile. These misconceptions result, of course, from the intervention of the Government in the war economy, both in production and in distribution. As a great consumer and also as a great production-aiding power, the Government alters the meaning of ordinary market facts, and must itself supply some of the necessary reinterpretations. But the task is difficult, and false views get around.

For example, the benefits of rationing, as long as supplies are still sufficient, appear only if we imagine the scramble that would take place were the Government to think merely of the soldier in dividing the wartime food supply. Like a brake on a steep slope, rationing retards war scarcity. It may squeal but will hold. Among the thoughtless, however, this very fact provokes complaints; they suppose, because they can still eat well, that the rationing isn't necessary. They see the inconvenience and not the reward—the administrative procedure and not the social benefit.

The Case in Brief

It will consequently be useful to sketch the history of our price-stabilization system, and to look at some of the problems with which it must deal. Prominent among them is the coordination of the farm price structure with the consumer ceilings. The total program endeavors to control inflation; hence we must see what inflation is and why it should be feared. The reciprocal relationship between prices and wage levels will require attention, because this is the core of the matter; also the interest the Government has in price control, both as a tremendous buyer of goods and services and as a heavy debtor to the Nation's bond buyers. Techniques for stimulating farm production, and yet not adding to the cost of living, will be analyzed. Such techniques may partly answer the double need of rewarding difficult or locally high cost production and, at the same time, holding the cost-of-living front.

We should recognize at the outset that substantial increases in farm prices from the relatively low level (74 percent of parity) that prevailed in 1939 were inevitable as we moved into a full war economy. Actually, farm prices in 1943 will average about 80 percent above the average for the 5 years that preceded the opening of the war. It is now apparent, however, that further increases in farm prices generally will not add much, if anything, to the volume of farm production and that the general price level should now be stabilized. This does not mean that we should attempt to establish or maintain absolute rigidity. It does mean that such adjustments as we make in prices from now on should be confined to adjustments in relative prices, in order to aid in getting more production of the commodities most needed. It means also that necessary adjustments should be so handled as not to increase food costs at retail.

Price Control Not Enough

Furthermore, we should recognize that any successful stabilization program will involve more than simple price control. Government buying for war uses reduces the supply of civilian goods; meantime increased consumer incomes strength the consumer demand. The resulting unbalance between goods and money exerts steady inflationary pressure. As far as possible the excess purchasing power should be absorbed. As one means of doing so we need to go much further in increasing taxation than we have so far ventured. But all excess civilian buying power cannot be removed by this single method. In fact, attempts to go all the way could hurt civilian morale and affect civilian production. Consumer incomes have increased unevenly and it is difficult to increase tax schedules sufficiently to absorb excess purchasing power of all individuals without working hardship on many persons whose incomes have either not increased at all or have increased only moderately. It is desirable that individuals should reduce their private debts and purchase as many Government bonds as possible. Such actions will reduce the inflationary pressure, help to finance the war, and build up savings reserves for use in the postwar period.

All this adds up to a positive program with 5 main elements. Absence of any one of them would frustrate it. These elements are: (1) Proper stimulus to production, since food must be available as well as reasonably priced; (2) price control and rationing along with harmony between prices paid to producers and prices paid by consumers—brought about if necessary by the use under certain conditions of subsidies, of resale programs, or of purchase under contract; (3) stabilization of wages (except for adjustment of substandard wages); (4) an adequate taxation and bond-sales program, and (5) action to reduce debts, build up desirable savings, and practice economical consumption. Largely, the procedure reflects principles peculiar to the war economy, principles which have no counterpart in peacetime.

One example of these war-economy principles will illustrate the point; it concerns the difference between the way prices operate in peacetime and the way they operate in wartime. In peacetime, when normally we have unused reserves of land, labor, and capital, a rise of prices corrects itself, because it draws the reserves into use. Production overtakes prices and brings them down. In wartime, on the other hand, supply cannot possibly overtake demand, which increases up to and beyond the limits of production.

Left uncontrolled, the demand simply boosts the entire price level, with relatively small additional effect on supply. With all facilities in approximately full employment, it becomes finally impossible to get a continuous over-all increase in production. More selectivity in farm and factory operation is then the one recourse; more effort along some lines and less along others. But this means priorities, price control, and rationing; it means broad programs to prevent inflation; it means general stabilization combined with redirection of farm and factory effort. This is the phase we are in now. Our progress

through it will depend largely on the extent to which we recognize and obey the special logic of the war economy. How we proceed will be important, perhaps vitally so, in facilitating adjustments after the war is over.

Growth and Change in Wartime Price Control

Our stabilization program started from mere "price watching" in 1940, grew into selective or limited price control, and then widened into a comprehensive many-sided policy designed to brace the whole economy against wartime strains and stresses. The short term for it is "inflation control," and it will be useful in a moment to see what inflation is. But first let us notice some landmarks in the wartime program for controlling inflation.

Stage by stage, from the price-watching period, the program added new elements and new techniques, notably rationing as the counterpart of price control and wage and salary stabilization as protection against inflationary spiraling. Actual price control began in 1941 with price-freezing orders on metals and other industrial products. Quickly the control broadened. Under the Emergency Price Control Act, under which regulations were in effect from January 30, 1942, to October 2, 1942, most nonagricultural products became subject to ceiling prices, and also about 40 percent of the farm products.

In this period, however, the Emergency Act forbade OPA to set ceilings on processed or unprocessed agricultural commodities below a point which would return to farmers the highest of these four prices: 110 percent of parity; the market price on October 1, 1941; the market price on December 15, 1941; or the average price from July 1, 1919, to June 30, 1929. Under this arrangement the prices of uncontrolled foods advanced considerably.

Accordingly, in October 1942, Congress amended the price-control legislation. The new measure (Public, 729, approved October 2, 1942) directed the President, through any Government agency, to stabilize prices, wages, and salaries. Under certain conditions, for example, to meet rising labor costs or other expenses of production, the law authorized modifications in farm prices. An Executive order dated October 5, 1942, extended price control to about 90 percent of our food at the retail level, though it still left out important seasonal products such as most fresh fruits and vegetables.

Taxes, Wages, and Other Factors

The anti-inflation program has gained strength also from other Nation-wide procedures. Taxes have been increased, with the double object of lessening the need for borrowing by the Treasury, and of checking the tendency of consumer buying power to run too far ahead of the goods supply. Ceilings have been established on rents in nearly all areas affected by war industries.

Under the so-called Little Steel formula, the National War Labor Board has established and generally maintained a yardstick for wage stabilization. National campaigns have stimulated War bond buying,

the rationing system has been extended, curbs have been imposed on installment credit, and educational campaigns have discouraged speculation and promoted debt liquidation. These connecting dykes and levees are holding pretty well.

On April 8, 1943, the President issued his "Hold the Line" Executive order. This order directed the Price Administrator and the War Food Administrator to extend the ceiling principle immediately to all commodities that affect the cost of living. It also instructed these officials to authorize no further increases in prices except to the minimum extent required by law, and to use all their authority to reduce or stabilize the cost of food. In addition the order contained equally explicit instructions for the War Labor Board and the War Manpower Commission.

In line with the April 8 order, Government agencies have taken a number of important steps. The Office of Price Administration and the Reconstruction Finance Corporation have worked out, and since June and early July, have operated a program which reduced the retail prices of butter and the chief cuts of pork, beef, and lamb. Under this program the prices at retail of the commodities mentioned have been reduced about 10 percent. Payments equivalent to this reduction have been made to processors from the funds of the Reconstruction Finance Corporation, so that prices to producers can be maintained at the original level.

Live hogs and apples have been brought under ceilings. Also, the general outlines and key prices for ceiling or control regulations for beef cattle and winter fresh vegetables have been announced. In addition the War Food Administration has worked out a program of payments to fluid milk and butterfat producers for the last quarter of 1943, in order to cover increased costs of dairy feed to dairymen without affecting the price of milk and other dairy products at retail. Altogether, the price of almost every important food product is now subject to ceiling regulation, at the farm level as well as the retail level for a considerable number of commodities.

The Government in some cases is indemnifying processors and distributors for losses incurred or anticipated through lack of agreement between farm and ceiling prices, and in other cases is encouraging additional farm production at no extra cost to the consumer. This type of action is a keystone in the price-stabilization arch.

In short, the inflation-control or price-stabilization program embraces the entire economy. The parts of it make sense only in relation to the whole.

Necessity in Price Stabilization

Beneath this program lies necessity; for war makes scarcity all along the line. If we had too much of anything, it would mean we had needlessly too little of something else. It would mean that our production was not efficiently selective, and was not yielding maximum fighting power. Total production cannot possibly keep up with the demand. In all directions more can be used than can be had; hence the allocation, rationing, and pricing of supplies are unavoidable. It all adds up to regulated rather than competitively

determined price and wage relationships, with the general object of producing what we need and utilizing it to the best national advantage. What the individual sacrifices as producer or consumer, he gets back as citizen.

With demand practically infinite and supply limited, the supply and demand way of setting prices won't work. In some lines, for example, automobiles, the war takes care of the situation by making cars almost unobtainable. Nevertheless, a few new cars can still be had. It is easy to imagine what would happen to the price if there were no controls. The sky would be the ceiling.

Without price control and rationing the same situation would exist in foods, since the potential civilian demand is above the available supply. This is not a result of any decline in the civilian food supply below the pre-war level; on the contrary, the civilian per capita consumption this year will be slightly higher than it was in the pre-war period 1936–39, and it will be better distributed. It should be borne in mind, however, that although average per capita consumers' incomes have about doubled since 1935–39, all incomes have not increased equally. In fact, the incomes of a considerable number of families have actually not increased at all. Hence, food would be distributed very unequally if rising prices were allowed to control its distribution.

Under such conditions overbuying by the well-to-do would mean disastrous scarcity for the poor, who would have to pay excessively for less than their fair share of the available supplies. Even with price control we do not necessarily assure a fair distribution of the scarcer items. Only rationing can do that. The price-stabilization program is consequently not optional but compulsory. Our choice is not whether we should have general price control along with rationing of some of the scarcer items, but rather how well we shall allow this system to work. Since incomes in wartime are not in balance with the supplies available we cannot dispense with wage control, price control, rationing, heavy taxation, and bond buying. We must see that they work.

What Inflation Is—Why We Should Fear It

Most people agree that inflation is undesirable and should be prevented if possible. Opinions differ, however, as to the nature and gravity of the danger. Some regard it lightly, in the belief that things can be done at a given stage to obviate or lessen the bad effects. Others hold that after an inflationary spree nothing can prevent a tail spin. As to why inflation is bad, ideas range from the crude notion that it is a habit-forming drug best left alone to the belief that ultimately it corrupts and destroys the medium of exchange. We may say, without attempting a precise definition, that inflationary price rises occur when production facilities are in approximately full utilization, and when purchasing power increases out of proportion to the supply of commodities available on the market. Our experience during and after World War I can provide lessons for us now.

Contrary to a popular impression, inflation does not indefinitely stimulate production. It has a stimulative effect only in the early

stages, when production facilities are still not fully utilized. Later, when unemployment of labor and resources has almost disappeared, additional inflation causes a further rise only in prices—not in output. In World War I, for example, our industrial production rose sharply from the beginning to the end of 1915, in which period credit expansion was only moderate. Thereafter it increased very little, though credit expansion then became tremendous. The Federal Reserve Board index of industrial production was only slightly higher at the end than at the beginning of 1916, and reached a peak in May 1917, 1 month after our entrance into the war. In did not reach that level again during the entire war period.

Inflation Inefficient and Unfair

Another effect of general inflation which came to light in World War I, and which would have been troublesome had the war continued longer, is the tendency it has to prevent selectivity in war production. It raises the prices of things not required equally with the prices of essential things, if not to a greater extent. This leads to a waste of manpower and resources, even in the presence of some priorities; it is not an efficient way to effect the needed redistribution of resources. In such circumstances farmers and industrialists produce chiefly what will bring them the most money, rather than chiefly what will contribute to the war effort. In fact with inflation running wild, the temptation to overproduce nonwar goods can become irresistible, since it doesn't run up against the rules and regulations involved in producing war goods. In the present war, with its stupendous drain on farm and factory resources, coordinated war production absolutely necessitates inflation control, since it necessitates priorities and rationing. These three things go together; in the absence of any one of them we should have production chaos.

Also to be considered is the truism that inflation bears unequally on different groups. It distributes gains and losses with no reference to deserts. People who live on fixed incomes, such as salaried workers, public officials, annuitants, pensioners, and bondholders, have their purchasing power greatly impaired, while other groups enjoy an automatic increase in their buying power. Most debtors have their debt-load eased; almost every creditor suffers a loss. Moreover, the effect of inflation on the distribution of income extends also to the distribution of resources; it shifts the ownership around in a manner largely unrelated either to production or to thrift. At a time when the Nation demands a common, cooperative effort from its people, it is bad to put a premium on speculation, as acquiescence in inflation does.

Potential Threat to Whole Economy

The main objection to inflation, however, lies in the fact that it compels people to exchange goods and services for money of uncertain and declining value. It may lead to a general flight from money into goods or resources; but after a while in the extreme cases the flight becomes difficult, either because money prices rise too high or because owners of goods or lands will no longer sell. Some inflationary situa-

tions stop at less disastrous points, usually as a result of painful economic readjustments. But once inflation gets under way, it carries the *threat* of damage to the money system, so that even day-to-day transactions may lag, not to speak of long-term investments. Large-scale private construction financed with mortgages or bond issues, for example, is impossible if investors do not know what their money will be worth when the time comes to collect it. They may not care to lend even to the Government.

Moreover, the national interest in maintaining relatively stable prices and a dependable currency extends into the future. It is shortsighted to suggest, as some persons have done recently, that we should allow a general inflation and deal with the consequences when they develop. This would work only to the extent that people did not know the day of reckoning was coming. It would trade on ignorance, or even deliberately contemplate an abuse of confidence. On a foundation as shaky as that, building for the future would be difficult; it would run especially into difficulties in foreign trade, in which the old dilemma would confront us of adjusting domestic to world prices. Getting our cost and price structure back into line with world levels, after the double shock of inflation and deflation, would be a long, slow job, in the course of which the illusory gains of the inflation period would melt away.

Farmers' Stake in Inflation Control

Farmers suffer particularly from inflation and its aftermath. In the early stages, prices received by farmers tend to increase more than prices they have to pay. In the later stages, however, prices paid tend to increase more than prices received. This tendency increases throughout the deflationary period. Analysis of price trends during and after World War I provides an example. The ratio of prices received to prices paid tended to improve from 1915 to 1917. It deteriorated moderately from 1917 to 1920, although in that period the general price trend remained upward. Finally, from 1920 to 1921, it dropped sharply, when the general level of prices fell, also.

Note the trend in World War II. The ratio of prices received by farmers to prices paid by them increased between August 1939 and August 1941. Then came a period in which the main trend of these two groups of prices remained parallel (August 1941 to April 1942). The subsequent freezing of most nonagricultural prices resulted in some further improvement in the ratio of prices received to prices paid. It reached a level of about 15 percent above the average for the years 1910–14, or a level about equal to that of February 1918. But if inflationary spiraling developed unrestrained, the ratio would turn downward sooner or later. It should be borne in mind that civilian supplies of many manufactured goods are being reduced, whereas the supply of foods increases. True, the increased supply of food is available only in part for civilian use, but it exists. Moreover, the farm production power is still increasing.

Hence inflationary spiraling of prices and wages would lead inevitably, if long continued, to a shrinkage in the purchasing power of the farm income. In the last war the purchasing power of farm

income began to decline in 1918, although in monetary volume it continued to increase until the beginning of 1920. Should deflationary conditions develop in the next post-war period, as a result of failure now to check inflationary tendencies, farmers would be among the worst sufferers.

Combined Production and Price Objectives

Main stabilization goals are:

(1) To maintain and increase production; (2) to stabilize living costs; and (3) to save money for the Government, now the purchaser of more than half the gross national product.

These are complementary objectives. Treating them as if they were conflicting, or even separate, can mislead. For example, the wish to put production above price control and governmental economy can be self-defeating, since with prices considered no object, both consumers and the Government would find themselves in financial difficulties. Conversely, the tendency of consumers to want prices as low as possible, without regard to whether such prices will or will not sustain production, is likewise unrealistic. Emphasis may have to be shifted among these objectives from time to time, and occasionally they apparently conflict; but in the end they must come together.

The Government endeavors to hold the balance even. Equally interested in getting supplies and in maintaining its power to buy them for as long a period as may be necessary, it wants to promote all necessary war objectives simultaneously, those that depend on production and consumption in the cities along with those that revolve about the farms. It attaches special importance to the fact that food costs enter significantly into all war costs, directly in actual Government purchases of food and indirectly to the extent that food costs influence living costs and, consequently, wages and product prices in war industries.

Supports and Ceilings

On the production side the War Food Administration obeys specific Congressional instructions to support prices through loans, purchases, and similar methods. Under amendments in 1942 to the Agricultural Adjustment Act of 1938 and to the Emergency Price Control Act of January 30, 1942, WFA provides price supports for many agricultural commodities—especially for the basic commodities, corn, cotton, wheat, tobacco, rice, and peanuts, and other crops such as soybeans and potatoes, which the War Food Administrator has announced are required in increased quantities. It observes the legislative direction to assure prices at not less than 90 percent of parity or comparable prices except for wheat and corn which are being supported at 85 percent of the parity level. All this takes place in line with directives developed largely independently of living-cost control.

On the other hand, action by OPA looks toward consumer protection as required by the price-control legislation. It endeavors to stabilize the cost of living as nearly as possible at the level that existed on

September 15, 1942, so that wage levels, too, may be stabilized. In part it succeeds, necessarily at the cost of increasing conflict between the farm and the ceiling-price levels. In part it fails, as shown by the fact that in July 1943 the cost-of-living index of the Bureau of Labor Statistics was several percent above September 1942. It has not been possible for OPA to carry out its orders and at the same time have its ceilings in every case above the price supports which seem necessary in the interest of production.

Action on the farm production, price control, and other fronts should be geared together. Want of such coordination may interfere with or disturb the production program. In the fall of 1942, for example, the Department asked farmers to decrease their intended 1943 plantings of some minor crops, such as watermelons, cantaloups, head lettuce, cucumbers, and other vegetables that contain a high percentage of water. We did not have ceiling prices in 1943 on most fresh vegetables; nor did we endeavor to restrict the use of labor, materials, or transportation as means of influencing production away from the less essential crops. In consequence, farmers who complied with the Government's request to grow other crops lost a chance to make some money, while many of those who did not comply made exceptional profits, since prices of several of the less essential crops moved sharply upward. Such noncompliers had the twofold advantage of diminished competition and high consumer demand for food commodities of all kinds, the unrationed along with the rationed. This is just one example of the need for complementary action on all related fronts if the desired ends are to be most effectively achieved.

Obstacles in Maintaining Balance

But keeping the farm support line in balance with the ceiling line runs up against obstacles. In the first place, agriculture's costs of production do not stay fixed, but rise from the effect of labor shortages, machinery shortages, and the necessity to cultivate more and more of the less fertile land. As the farmers' costs rise, the parity price average rises too, and, consequently, the farm price-support line. Also, we have such urgent need for certain crops, that the Government must offer prices which will draw labor and land into them. Hence, we can work readily on the farm price structure only in the upward direction. Action to reduce prices is more difficult.

Though the administration can encourage the production of the crops particularly wanted, it has much less power to shape prices so as to retard the production of the less essential things. This difficulty results partly from long-standing legal requirements as to farm prices and partly from the wartime conflict between getting production on the one hand and holding the cost of living stable on the other. It points to the need of flexibility in the farm price structure. Growing divergence between prices at the farm and prices to the consumer means defeat in the battle against inflation. The farm line, as well as the ceiling line, must be held, if we hope simultaneously to boost production, control living costs, and avoid unnecessary expense to the Government. Farm price policy should stimulate production without constantly raising the retail price average. Such a program is pos-

sible, and is already being used in the case of oil crops, canning crops, and feed wheat.

Ceiling and Support Price Relationships

As one means of controlling the tendency of farm and ceiling prices to conflict, limited use is being made of special programs, some of them started several years ago, such as certain purchase and resale operations of the Commodity Credit Corporation. The President on July 2, 1943, vetoed a bill (H. R. 2869) which would have forbidden, with some exceptions, the use of any subsidy to reduce or roll back feed prices. The Congress did not override the veto, and in consequence, the above-mentioned programs have been used in several cases as an auxiliary to the "hold the line" program. Such payments use borrowed funds, but the resulting inflationary tendency they have is less than would be involved in general price advances, or in reduced production.

Calls for increased farm production often require special farm price supports. These may sometimes have to be above the parity level, since the great basic crops—corn, cotton, wheat, and tobacco—must be supported at 85 or 90 percent of parity and since ceilings cannot be fixed on any commodity or the products thereof at less than the parity level. These rigidities, or statutory requirements, encourage sustained and even increased production more or less all along the entire agricultural line, but parity prices do not of course measure relative war needs as such. Sometimes they even favor the less essential crops.

Price supports for urgent crops such as soybeans and peanuts for oil, potatoes, dry edible beans, and hemp must therefore be substantial if they are to channel the agricultural effort suitably. Inevitably they clash sometimes with the stabilization objectives at the consumer level. Supplementary programs, as an alternative to advances at the consumer level, may well be used on occasion to smooth out the disparity, provided the support prices are raised very carefully and selectively. Adequate production and stable retail prices are twin objectives. It is important that both be achieved.

It isn't essential that the farmers' prices or returns should always be below the ceiling level; but the two lines must be roughly parallel. They must not conflict too much or too often. But occasionally the need for war crops may call for prices higher than consumers should be asked to pay. Operations of the Commodity Credit Corporation recognize a number of such cases, in which the corporation supports prices to farmers at one level and sells them to processors or distributors at a lower level. The Treasury absorbs the loss; it uses the public taxing and borrowing power to cover a charge which should not fall exclusively on any group, even one as large as that represented by the consuming public. And unless some such device is used the cost of living, wages, and the costs of war materials cannot be stabilized.

Farm Earnings High

As we all know, farmers are making money. Their income from marketings this year may run above 19 billion dollars, as compared

with 15,500 million dollars in 1942. The 1942 figure was more than one-third greater than that of the previous year, and with Government payments made a cash farm income of 16,200 million dollars. The corresponding pre-war average (1935–39) was 8,500 million dollars. Farm costs have risen, but not as much as the farm income. Realized net income of farm operators in 1943 will probably amount to about 12,500 million dollars, as compared with 9,500 million in 1942 and 6,300 in 1941. Current prices encourage most farmers to use all their available resources, though it does not follow that prices for all farm commodities are necessarily satisfactory. Some prices may be too high and others too low to get the best result in terms of war production. From the standpoint of the farm income, however, the position is exceptionally favorable.

The income of persons on farms has improved in relation to that of persons not on farms. At the outbreak of the war, the income per capita of persons on farms was below the pre-war (1910–14) parity. Production and marketings of farm products have since increased greatly, and the demand has been such as to raise prices with the increase in production, as in the World War I period. In 1939 the receipts from marketings, with the addition of Government payments, raised the per capita income to persons on farms to only 94 percent of parity with the nonfarm income of persons not on farms. By 1941 the farm income from marketings plus Government payments exceeded parity. Including Government payments, the income per person on farms in 1942 amounted to 138 percent of parity, which compares with nearly 147 percent in 1917 and 165 percent in 1918.

In considering the increase in income to farmers, account must be taken of the fact that costs commonly change more slowly than the market prices of farm products. Farmers are temporarily using up accumulated resources, which they will find it necessary to replace at a higher cost level. Furthermore, when the demand for farm products slackens, the income from farm production is likely to decline sharply, while costs continue to rise. Farmers therefore should be accumulating reserves in these years in which prices and income rise rapidly, to restore farm capital and to provide funds for maintenance of living conditions in case prices and incomes decline sharply after the war. In proportion as they do so, they will promote the campaign against runaway inflation.

The Volume Factor in Farm Incomes

Prices are only one of the two major factors in farm returns; production is the other, and farm production is running much higher than in recent years. In 1942 it was 25 percent above the 1935–39 average. The increase in production during World War I was smaller—an average of only 9 percent from 1910–14 into the 2 years 1918–19. Farmers planted a larger acreage this year than they did last year, and the outlook at this writing is for yields about equal to the average for the 5 years 1937–41 though below last year's exceptional outturn.

Production of eggs, poultry, pork, and lard promises to be even greater than in 1942, while dairy, sheep and lamb, and beef produc-

tion seem likely to be maintained at about the same level. Farm production and marketings will be somewhat larger than production and marketings in 1942, in which year the cash farm income from farm marketings plus Government payments was over 16 billion dollars as compared with 8.5 billion dollars in 1935–39 and the previous record of 14.6 billions in 1919.

In fact, production and marketings this year, if they fulfill the expectation, may provide about one-sixth more cash income. Net income to farm people from agriculture in 1942 ran over 11 billion dollars as compared with an average of 5.3 billion dollars in 1935–39 and 9.9 billion dollars in 1919. This year's net income from agriculture to farm people seems likely to show a further considerable increase though it will amount to only about 10 percent of the estimated national income.

Many Farm Disparities Continue

Attention has been called to the fact that farmers generally are now getting more than parity prices or parity incomes as these standards are now defined. But in all fairness, attention must also be called to the fact that such returns still do not give farmers the same per capita income as nonfarmers and that the 20 percent of our population living on farms will receive only about 10 percent of the national income in 1943. But all of us must make sacrifices, and the parity goals for which farmers fought during the decade before this war should serve as a reasonable standard during the war. It must be remembered, however, that there are still too many farmers working too long hours and that there are a great many farm families whose incomes are not sufficient to allow them to maintain a decent standard of living. So far as we can, we should see that these farmers are given every chance to increase their incomes through adding to food production during the war and that actions are not taken which will place these and other farmers at a disadvantage in the years after this war ends.

Place for War Risk Insurance

Some farm difficulties should be recognized. Farmers want to maintain or increase their production in order to make their contribution to the war effort, but with price ceilings in effect when yields are subnormal the compensation they ordinarily receive may not be available. Short yields in the war period may result in severer consumer rationing rather than in compensatory advances in market prices. This can deter some farmers from taking the risks involved. Some type of war risk insurance might be useful.

The current program gives farmers reasonable assurance of fair returns over the several years ahead since the Act of October 2, 1942, (Public 729) guarantees 90 percent of parity for most farm products not only during the war but for at least 2 years thereafter. Other legislation further guarantees them a reasonable period within which to make readjustments when the war emergency is over. In other words, the system already affords price insurance to some extent on

specific terms and for a period which have no counterpart in the Government's dealings with other producers. But more specific insurance features might possibly be worked out to assure farmers of covering costs each season in high-risk areas or for crops not yet customarily grown.

Teamwork—the Key to Price Stabilization

Briefly, the stabilization program endeavors through action synchronized in town and country, to establish farm prices which will maintain or increase the farm production and at the same time hold down the cost of commodities to consumers and of war materials to the Government. It departs from the ordinary or peacetime way of influencing production through prices; in the first place because prices do not have their normal effect on production when land, labor, and other facilities are scarce; and secondly, because the quantity of consumer purchasing power in existence is so great that in the absence of rationing and price control it would produce inflation. The war effort would suffer a double check; it would lag on the production front and would then put domestic worries above plans for victory. Uncontrolled inflation here would be worth many army corps to Hitler or might turn military victory for us into economic defeat. The control program is a teamwork job. Every individual and every group should understand it and be willing to shoulder their share of the task.

CONTROLLING INFLATION IN FARM LAND VALUES

Controlling inflation is not simply a matter of holding down commodity prices by rationing, price-fixing, and other means. It includes preventing runaway prices of capital assets, including farm land.

The inflationary forces that could cause a harmful boom in farm real estate also affect the markets for corporate securities, urban real estate, and other capital assets. Certain facts indicate, however, that the danger of a farm-land boom is greater than the danger of a boom in urban real estate or in the stock market.

At the root of the problem lies the basic fact already mentioned—that farmers and other people are getting more and more money, while the amount of consumer goods available is decreasing. Consequently large surplus buying power is accumulating and is being only partially absorbed in taxes and Government bonds. From the end of 1939 to the end of 1942 currency in circulation and commercial bank deposits increased 30 billions, or almost 50 percent. Further large increases occurred during 1943.

Country bank deposits in the 20 leading agricultural States have shown even greater relative increases. Demand deposits of Federal Reserve member banks in places of less than 15,000 population in these States increased by more than 100 percent from January 1940 to January 1943. More than three-fifths of this increase occurred during 1942, and further substantial increases were reported during the first half of 1943.

Such money is inflationary. The Federal Reserve Bulletin recently described the principle. "So long as most of the additional bank deposits remain idle, the immediate inflationary consequences of their expansion would be negligible," said the Bulletin. "If, however, depositors should endeavor to spend their funds even as actively as they did in 1942, which was not a year of exceptionally rapid turn-over of deposits, the pressure on prices would be serious."

Capital asset prices, as well as commodity prices, would be under serious pressure. Moreover, the chances for a diversion of surplus funds into the capital-assets markets would increase to the extent that commodity prices were held down. It is important to note also that Federal law now enforces large margin requirements in the securities markets and heavy down-payment requirements for a large class of urban real estate. Hence, the uncontrolled farm real estate market would appear to be more vulnerable to speculative and refuge-seeking capital.

Even though farmers themselves might be cautious about bidding up the price of land, city investors with surplus funds might consider farm land one of the best available outlets. In some sections of the country, many of them already do.

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Selling by "Unwilling" Owners

Voluntary transfers of farm real estate were numerous during the years 1940–42, as a result partly of heavy selling by "unwilling owners." Insurance companies, mortgage companies, commercial banks, and Federal and State lending agencies were able to sell a large proportion of the farms they had acquired involuntarily as a result of the depression. Many estates and elderly farmers also took advantage of the greater demand for farms and sold out. This selling helped to keep land values down during those years.

But the major part of this class of farms has now been removed from the market. Sale of it to operators and investors has been followed by a marked strengthening of land prices. The value-stabilizing influence of farms readily purchasable at relatively low prices has been largely dissipated, and in some sections eliminated. Except in the extreme western Corn Belt, in the northern Plains, and in a few other scattered areas, this influence will no longer be a significant counterweight to inflationary forces.

Sharp increases in land values occurred during the winter of 1942–43. From November 1, 1942, to March 1, 1943, the index of average value per acre of farm real estate (1912–14=100) rose from 93 to 99. By July 1, 1943, the index was at 102, as compared with 85 in March 1941, 84 in 1940, and a low of 73 in 1933. Thus, in midsummer 1943 average land values were 40 percent above the '33 low and 2 percent above the 1912–14 base, though 40 percent under the inflationary peak of 1920. The average rate of increase during the year ended July 1, 1943, was about 1 percent a month, the highest of record outside the boom year 1919–20. Further advances would be a matter of public concern.

Measured from 1935–39 averages, values increased, by July 1943, two-fifths in the East South Central States, almost a third in the East North Central division, and more than a fourth in the Pacific, Mountain, and South Atlantic divisions. Rises in other geographical divisions ranged from 19 percent in the West South Central States down to 8 percent in New England, with an increase of 23 percent for the country as a whole. In some individual States and in particular areas within States, much larger increases have occurred. A rise of more than 50 percent from the 1935–39 acreage is reported for Kentucky; over 40 percent for Indiana, Tennessee, and Wyoming; and over 30 percent for 12 other States.

Avoiding a Hazardous Land Boom

Yet a hazardous land boom may still be avoided if action is prompt and decisive. First, taxes should be made still heavier for all groups able to pay. Second, the Government must borrow the current money savings of the people from the people. It does not suffice for the Government to borrow simply from the banks. On the contrary, Government borrowing from commercial banks creates more money, and adds it to the funds already in the hands of the public. Third, pressures to raise commodity price and wage ceilings must continue to be effectively resisted.

If we did all these things sufficiently, we could stop general inflation. But some possibility might still exist of excessive increases in land values. Chances for a widespread land boom would be reduced; but the already-high levels of farm commodity prices and farm incomes might continue to attract much liquid purchasing power into the farm realty market.

Prudent farmers remember that mortgages run for 30 years and that current high prices and incomes may last only a few years. Such farmers with big bank accounts may, nevertheless, after a while yield to temptation and pay too much for more land, especially if other speculators and investors are giving impetus to further marked increases in farm-land values. Few farmers want a runaway land market, but many have wanted land prices "to jump up a bit," and substantial increases have occurred. Further market rises could easily engender widespread speculative activity.

Why a Land Boom Should Be Avoided

The last big boom reached its height in 1919–20. Then, for 13 long years, land values were on a toboggan slide. The slope was steep from 1920 to 1924, fairly gentle from 1924 to 1930, but again steeper than ever from 1930 to 1933.

But the trend of land values fails to tell the whole story. Foreclosures and assignments are a part of it. In 1921 farmers and "investors" began losing their farms in mounting numbers. By 1926, 7 farms were lost for every 1 lost in 1912—and by 1932 the ratio was almost 16 to 1. Estimates have placed the number of farms and tracts lost by forced sale since 1920 at more than 2 million. The equivalent of one-fourth to one-third of all land in farms has gone through forced sale in the last 22 years. Most of these forced transfers resulted from someone's borrowing too much and paying too much for land.

Even the figures on how many people lost their land leave much unsaid. Loss of the farm often meant loss of a man's or a family's life savings. Usually it meant moving, and moving down the "agricultural ladder," back to the status of a tenant. Frustration, failure, and fear became the lot of thousands of farm families. The more dogged, stubborn owners did not yield easily. They hung on—many for just a few years. But some of them are still hanging on. Heavy required payments for interest and principal on excessively mortgaged farms have reduced great numbers of these farm families to low standards of living. Some farms have finally been paid for with the toil, worry, and privation of a lifetime. In the break-up of the inflated financial structure farm families have been jostled and crushed. Local banks and their depositors, individual lenders, insurance companies, and other financial institutions have been severely shaken and sometimes destroyed.

There was a second major wave of foreclosures which began in 1930 and caused great social bitterness. Farmers felt resentment toward creditors and officials who sought to carry through foreclosure and dispossession. Sometimes farmers and their neighbors resisted eviction by physical force. Creditor's agents, judges, and

sheriffs occasionally suffered violence. In some areas the normal civil process of foreclosure and execution had to be virtually suspended.

Some States adopted mortgage-debt moratoria. Voluntary debt adjustments involved reductions totaling millions of dollars. These were made informally, often with the aid of Government-sponsored debt-adjustment committees. Federal and State lending agencies "bailed out" private lenders, and adjusted the burden on mortgagors by refinancing hundreds of millions of dollars of farm-mortgage debt. Much of the cost of these programs fell upon the general taxpayer.

Preparations for Different Possibilities

Concern over wartime increases in land values and in mortgage debt assumes that land prices will fall after the war. While such a post-war price crash is not inevitable, the outlook is uncertain and points to at least one important conclusion. The basic justification for special controls of land values during the emergency period lies in their insurance aspect. Letting land values and debt go where they will involves a gamble. Adjustment from controlled lower levels to permanently higher post-war levels, should the general trend continue upward, would be much less disruptive than would adjustment from uncontrolled inflation values to substantially lower price levels.

The safe course would appear to be to slow down the increases in value, debt, and rate of transfer until we have a surer basis for predicting future prices and income levels. Some public control of the farm land market during the present emergency is desirable for other reasons. In a boom the pattern of farm tenure would be distorted. Farm ownership and farm operation would drift apart. Both the number and proportion of nonfarmer buyers have increased significantly in some States in the last 2 or 3 years. To a large extent these people have been buying the better farms as investments and as hedges against inflation. This movement of land into nonfarmer hands, if extensive in an inflationary period, might mean a more or less permanent increase in farm tenancy.

City Buyers in Farm Land Market

Many farmers would find nearby townspeople and distant city buyers able to outbid them for land and unwilling later to sell at prices the farmers could afford to pay. Opportunities for tenant farmers to become owners would be fewer. Tenants and farm laborers would have less chance to rise to the top of the "agricultural ladder." Greater numbers would have to accept a permanently inferior status.

Permanent tenancy and widespread absentee ownership have not been a part of American tradition and land policy. On the contrary, ownership of the country's farms by the farmers themselves has been an ideal and a bulwark of American democracy. True, the ideal has not always been honored but we don't want to throw it away.

Two other reasons for trying to avoid a land boom should be noted. First, short-sighted exploitative farming usually follows an excessive rise of land values. When the inevitable slump arrives, owners with heavy interest and amortization payments to meet often may see no alternative to mining the soil. They must have cash income at any soil cost. Cash crops that exhaust the land may be planted year after year. Desirable rotations may be shortcircuited; use of fertilizer may be slashed or even cut out entirely; and other soil-building practices may be generally neglected. Enormous destruction of soil resources may be one result of a land boom. Any public remedies undertaken would involve cost to the taxpayer—either through absorption of private losses by public refinancing agencies or through subsidies for conservation. Moreover, during the speculative boom farm attention might be diverted from the task of producing food to socially unproductive and dangerous trading in farm equities.

Types of Control Measures

Few people find fault in principle with general, indirect control measures of the "sponge" type—heavier taxation and Federal borrowing of individuals' funds to soak up pools of liquid, inflationary buying power. Larger sponges of these types and more vigorous use of them would reduce the volume of excess money to less dangerous proportions. But such measures seem likely to be insufficient to eliminate danger of inflation in farm land.

One purpose of special measures would be to provide emergency barriers to keep liquid funds from flooding the land market. Emergency barriers could not withstand unlimited pressure; but before the breaking point was reached, we would have time to see the necessity for stronger action. So far, pocketbooks and commercial banks have served reasonably well as temporary retaining basins. The emergency "levees" at the entrance to the farm real estate or other capital asset markets would give additional protection against a harmful influx of speculation money into the farm realty market. Such special controls would serve a vital emergency purpose.

It may be ultimately more important to avoid land value inflation than to avoid other types of inflation. Many effects of mere price inflation are transitory, but the effects of land value inflation may persist for many years. Various direct emergency controls have been suggested. They are of three principal types: (1) Credit control, involving farm-mortgage debt ceilings; (2) heavy taxes, (a) on capital gains from resale of farms, and (b) on transfers of farms; and (3) land price ceilings and direct restriction of purchase privilege, administered by means of a permit system. The several types of measures indicated would have different special purposes and effects.

Credit control would limit the direct use of credit in the purchase of farm real estate and also limit the possible expansion of credit on farm real estate not transferred. A resale gains tax would serve to discourage or eliminate shorter-run speculation in land. Both measures would have a curbing effect on the volume of transfers as well as on land value increases.

Advocates of more comprehensive controls believe, however, that such a gains tax and credit-control measure probably would not be adequate to prevent a material rise in values resulting from widespread purchases by cash investors. If land-value inflation threatened from that source, they suggest a high-rate transfer tax as an additional step. Proponents of a direct purchase-permit system take the view that their plan will achieve practically complete control of all elements in a land boom.

TREND OF PRICES

The parity price index continued to advance through the year, and the price ratio improved. Prices paid by farmers, interest, and taxes advanced from 157 on January 15, 1943, to 165 in September of this year. This was an increase of about one point per month in the index. Prices of many of the goods and services farmers employ in production have been stabilized though not held to a flat level. The most marked advances in the prices of what the farmer buys have been in seed, feed, furniture, food, and clothing. Notwithstanding the imposition of ceilings, prices of farm machinery, fertilizer, building materials, and other supply and equipment items moved up a few points.

The advances in the prices of feed and seed were readjustments from very low levels, and were in effect prices paid by farmers to farmers. The advances in food, clothing, and furniture represent to some considerable extent advances in costs of processing and manufacture, in addition to some advances in prices of raw materials. In the latter part of 1942 items bought for living were advancing in price faster than items bought for production, but the difference in the rate of advance disappeared in the spring of 1943.

Farm wage rates advanced sharply from 220 in October 1942 to 280 a year later. This advance, of course, materially increased the farm operator's cost of production. The ratio of prices received to prices paid, including interest and taxes, advanced from about 100 in the summer of 1942 to 114 by the end of that year. In the first 10 months of 1943 this ratio fluctuated between 112 and 117.

Prices farmers pay may continue to advance to some extent, but the advance in the next 12 months may not be as great as that of the past year. Although effective price ceilings have been placed on many items that farmers buy, the average of prices paid has continued to advance, even under these ceilings, through one channel or another. As the costs of manufacturing and distribution have increased, ways and means have been found for effecting an increase in the average prices. These expedients have included the discontinuance of the low-priced items, the marking-up of commissions to cover increased costs of distribution, and the use of higher cost substitutes.

Prices received by farmers for all farm products in September 1943 averaged 193 percent of prewar (1909–14) prices, as compared with 163 a year earlier, an increase of more than 18 percent. Most of this advance occurred between September 1942 and January 1943; the continued advance in 1943 was at a slower rate. At the outbreak of the war in 1939 the ratio of prices received to prices paid, including interest and taxes, was only 72. By the summer of 1942 prices received by farmers were about up to parity, and they now average about 15 percent above. Prices of livestock products generally advanced to

parity quickly, while the prices of most crops lagged. By the summer of 1942 the only crops that had reached parity were rice, potatoes, and some types of tobacco. Subsequently, cotton prices advanced to parity and remained close to that level for many months.

All of the crops have now reached parity except wheat, hay, barley, and rye. From the outbreak of the war in 1939 to the end of 1941, the prices of farm products advanced at about the same rate as in the corresponding period of World War I, but in 1942 the advance was slowed up. The average of the prices of all farm products is now somewhat below what it was in the corresponding months of 1918. Indeed, the prices of crops in general are materially lower, and price controls may prevent farm prices from rising to the high points reached in 1919 and 1920.

The prices of most farm products are now subject to ceilings. On the other hand, supports have been provided to prevent them from falling to low levels. In other words, measures have been taken to establish maximum and minimum prices for many farm products, though in some cases the demand is so great that prices are pressing against the ceilings. This is true of practically all of the livestock products, and of most fruits and vegetables on which ceilings have been placed. In a few cases, on the other hand, the current and prospective supplies are so great that prices may be depressed below the ceilings.

For the full year 1943 the index of prices received by farmers will probably average about 20 percent above 1942. Adjustments in loan rates, support prices, and ceiling prices have increased the index somewhat. Maximum prices have been established for most farm products, but the demand has been great enough to maintain the actual prices at or near the established maxima. Probably the index of prices paid by farmers, including interest and taxes, will average about 164 for the year, as compared with 151 in 1942. Total cash farm income for the year, as estimated in September, will be in the neighborhood of 19.9 billion dollars. Production expenses will absorb an estimated 10.2 billion dollars. In the first 8 months of the year the income from various classes of products increased as follows over the corresponding period for 1942: Food grains, 27 percent; feed grains and hay, 29 percent; cotton and cottonseed, 41 percent; oil-bearing crops, 124 percent; vegetables, 44 percent; fruits and nuts, 35 percent; meat animals, 27 percent; dairy products, 22 percent; and poultry and eggs, 52 percent.

DISTRIBUTION OF FARM INCOME

The increase in farm income in 1942 over 1941, the greatest in any year in the Nation's history, brought the aggregate net cash farm income of operators to the highest point ever reached. Analysis of the distribution of farm income in these 2 years shows the meaning of these annual totals in terms of farm family welfare.

Such an analysis, based on information secured in a rural study of family spending and saving in wartime and on estimates of changes in the over-all farm income, has been made by this Department. It relates only to the families that operated farms and received income from the sale of farm products, and excludes the families of farm wage workers who were not farm operators.

Half of the farm-operator families in 1941 received less than $760 net cash income from all sources, including net receipts from the operation of the farm, earnings from employment off the farm, rents, pensions, and other income. In 1942 the income point which divides the families into equal numbers rose to $1,320. Families at or near the middle of the income scale had nearly a 75-percent increase in net cash income on an average, a gain only partly offset by a rapid rise in prices paid by farmers for commodities used in family living. Whereas the middle 60 percent of the families in 1941 received incomes varying from $260 to $1,670, the corresponding range in 1942 was from $430 to $2,740.

While the lower half of the families received 15.4 percent of the total income in 1941, they received 17.9 percent of the much greater aggregate in 1942. In fact, all groups save the upper 20 percent received a larger share of the 1942 income than of the 1941. Though the spread was wider in 1942 than in 1941 between the incomes of the lowest and the incomes of the highest group, the 1942 distribution of income appears to have been relatively more favorable to the lower income groups.

Changes in the distribution of the total net cash income held also for the distribution of income derived from farming alone. The median family income derived from farming increased from $440 to $980. The income range from $65 to $1,310, which included the middle 60 percent in 1941, increased to a range of $380 to $1,815 in 1942. Most striking was the change in the proportion of the total farm income that went to the lower income 50 percent of the farmers. In 1941 this group received only 7.9 percent of the aggregate net cash income from farming. In 1942 its share more than doubled and reached 16.4 percent. These families received a greater proportion of their income from nonfarm sources than did the upper 50 percent. Their income from nonfarm sources represented a considerably larger percentage of their total net cash income in 1941 than in 1942. Its absolute value, however, was greater in 1942.

Factors in the Changed Distribution

Some of the upward shift in per family farm income reflects the decrease that took place in the number of farm families from 1941 to 1942, but the primary factors were sharp increases in prices and in sales of farm products. The decrease in the number of farm families was undoubtedly greater at the lower than at the higher end of the income scale. Competing employment opportunities led a relatively large number of the smaller operators to give up farming. Some consolidation or abandonment of farming units resulted. In some cases the operation of smaller units was discontinued when the operator took a full-time nonagricultural job, though the farm home continued to be the family's residence.

Nevertheless, the situation does not justify complacency. Though the income of every group increased by a greater percentage than the increase in farm family living costs and though the income of lower groups increased proportionately more than that of higher groups, it should be borne in mind that half of the families of farm operators in 1942 received a total net income from all sources of less than $1,800, even with some $400 added as an estimate of the value of housing and food provided by the farm. In spite of the changes that favored the lower group, the upper 10 percent of the families received 37 percent of the aggregate net cash income derived from farming in 1942. The lower 10 percent received only 0.6 percent.

COMMODITY CREDIT CORPORATION

Before the war the justification for such an organization as the Commodity Credit Corporation was the need to support farm prices and increase farm incomes. Organized originally as an independent agency to meet farm requirements in the depression years, and subsequently incorporated into the Department, the CCC made loans to farmers on products stored on farms and in warehouses, at loan rates prescribed in the Agricultural Adjustment Act and other legislation. Borrowers restricted their plantings of surplus soil-depleting crops, increased their plantings of soil-conserving crops, and carried out soil-building practices.

Under war conditions, however, the Corporation has large additional responsibilities. Besides continuing to provide loans for price-supporting purposes, it must encourage maximum necessary farm production and at the same time cooperate with other Government agencies in programs to stabilize the cost of living. In consequence it engages in action of a dual sort—on the one hand to keep prices from going too low and on the other to keep them from rising too high.

First among the objectives now is maximum production of the right kind. Achieving it does not conflict with the farm-income objective, but it demands close attention to price relationships within the farm-price structure. If prices were to rise sharply for certain commodities, it would be more difficult to get increased production of other goods, which might be in more urgent demand.

Operations of the CCC this year have sought directly to prevent low prices in some cases and to prevent excessively high prices in other cases. For example, CCC loans have kept the prices of cotton, wheat, potatoes, and some other crops from falling. Conversely, CCC operations on oil crops and canning crops have encouraged production and at the same time helped to maintain the ceiling levels. Certain price-supports which otherwise would have clashed with the ceiling prices have been linked with action to relieve processors and others from price squeezes.

Pre-War CCC Operations

This type of CCC operation is not new. For example, the CCC released stocks of cotton and wheat in the 1930's at prices lower than those which it had paid for them. The purpose then was to cut the losses of the corporation; the purpose now is to encourage production and at the same time to maintain reasonable prices to consumers. But the procedure is about the same. It applies both to crops which would be lower and to crops which would be higher at the consumer level were the CCC programs nonexistent. Loan and storage operations maintain cotton prices in the periods of heavy farm marketings and make supplies available to keep cotton prices from rising too high at

other times. In consequence it has been unnecessary to have a ceiling price on raw cotton.

Loan and storage operations with tobacco work similarly. Expanded when the British withdrew from our tobacco market, these operations stabilize tobacco incomes and obviate pressure on the tobacco ceilings. Feed grains, feed wheat, and canning crops provide examples of price stabilization combined with price support under conditions which otherwise would mean sharply higher prices to consumers.

In order to maintain price stability, the CCC purchases the entire production of some crops. It controls the entire production of soybeans. Marked expansion in the output calls for the fullest possible utilization of the available crushing facilities, the relatively inefficient as well as the efficient. Moreover, large quantities of soybeans must be moved from the main soybean area to other localities that have facilities for crushing soybeans, when they are not in use for crushing cottonseed and other crops. It would be extravagant to provide margins for all processors on exactly the same basis. Margins necessary to cover crushing costs in the improvised plants or in areas distant from the main production areas would be excessive for the efficient, favorably located plants and would involve excessively high prices for the oil and meal.

The CCC takes over the entire soybean crop because otherwise it would not be possible to establish reasonable processing differentials. Similar principles apply to the handling of the peanut crop. As a result, soybean and peanut producers receive agreed prices, processors have assurance that they will be able to cover their costs and make a profit, and users of the oil-crop products obtain supplies at reasonable prices.

Handling of Canning Crops

In the handling of canning crops the operations of the CCC enable producers to get support prices and consumers to have ceiling prices lower than would be necessary otherwise. These operations result in some losses to the CCC. The production required is very large, and much of it goes to the armed forces and to our allies. Absorption by the CCC of part of the squeeze between the support prices and the ceiling prices reflects official recognition of the fact that the extra cost of getting sufficient production of the canning crops is to some extent a war cost and should not fall exclusively on the consumer. The same principle applies to sugar beets. In order to maintain the sugar-beet acreage, CCC is paying prices that are in excess of the present ceiling prices. It absorbs a loss on possibly one-seventh of the total production, and in this way prevents a rise in the price to consumers on the remaining six-sevenths as well.

Loans on Various Crops

In the fiscal year ended June 30, 1943, the CCC lent $806,103,000 to farmers in nonrecourse loans on wheat, cotton, corn, and other so-called basic and proclamation crops. It bought approximately $2,500,-

000,000 worth of agricultural products in domestic and foreign markets, and sold $2,800,000,000 worth of commodities under lend-lease and domestic-use programs. The CCC purchases greatly exceeded those of the preceding fiscal year, which amounted to less than $1,000,000,000. In the domestic market the purchases consisted largely of meats, dairy products, and poultry for lend-lease purposes. The purchases in foreign markets consisted principally of fats, oils, coffee, sugar, tea, and cocoa.

In 1943 the CCC was the Government agency for the purchase of imported agricultural commodities in a program to make possible the maximum importation of such commodities in relation to physical facilities and wartime economic needs.

As previously mentioned, some of the sales made by the Corporation involved losses. For example, it incurred a loss of $88,000,000 on 275 million bushels of wheat sold to livestock feeders at below-parity prices and a loss of $28,000,000 on grain sold for the production of alcohol. Programs for the purchase and sale of milk and cheese involved smaller losses. The oil-crops program involved expense to the Corporation. Out of its accumulated stocks the Corporation sold 1 million bales of cotton (principally for lend-lease) and 300 million pounds of tobacco. The sales of tobacco were part of a program designed to maintain the foreign market for American tobacco.

It should be borne in mind that the Corporation's sales of grain for livestock feeding and of certain oil-crop products under the programs above mentioned helped to obviate a substantial advance in feed prices, and in that way encouraged meat, dairy, and poultry production. The sales of grain at below-parity prices were by special legislative authority.

The CCC undertook a program to encourage the production and processing of hemp, vital for naval cordage and other war supplies. Arrangements in 1942 for the production of hemp seed enabled the Corporation this year to make contracts with farmers in the Midwest for the planting of 185,000 acres for the production of hemp fiber. These contracts provided for the purchase of the hemp straw for processing in mills constructed by the Defense Plants Corporation and leased by CCC. What the hemp program will cost cannot be calculated until the hemp fiber has been sold to the cordage mills.

Borrowing Power Increased

In July last, Congress extended the life of the Commodity Credit Corporation through December 31, 1943, and increased its borrowing power to $3,000,000,000 for use in loan, purchase, and sale programs designed to facilitate the production of food, feed, and fibers needed in the prosecution of the war. At that time the CCC loans outstanding totaled $479,099,000, and the commodities the CCC owned had a book value of $1,060,558,000. Commitments had been made under loan, purchase, and sales programs for practically the remainder of CCC borrowing capacity of $2,650,000,000. Additional borrowing capacity was needed to finance loans, purchases, and sales during the fall and winter of 1943–44.

FOOD DISTRIBUTION

Brief highlights of developments on the food-distribution front over the past year are:

Government procurement of food for war use has stepped up enormously. Purchases for the armed forces and lend-lease in the calendar year 1942 approximated one-eighth of total production; for 1943 they are expected to reach one-fourth.

Civilian rationing has been extended to a number of foods and food groups, and allocations and restrictions have been imposed on the processing and distribution of most foods. Although increased production has provided civilians with per capita food supplies at the level of 1935–39, increased consumer demand at controlled prices has far outdistanced supply.

Manufacture of dehydrated and concentrated foods to conserve shipping space has been greatly expanded. Egg-drying capacity, for example, has been increased more than eightfold. These processes have been greatly improved, and progress has been made on other technical problems of handling and shipping foods, such as packaging and compression of foods for overseas shipment.

The food industry generally has been assisted in obtaining priorities for materials and equipment needed to maintain the facilities for handling and processing that are essential for civilian supply as well as military and export needs. At the same time requests for priorities have been carefully screened to prevent diverting steel and other scarce materials to uses that are not truly essential.

Some Government Programs Discontinued

With the disappearance of surpluses and the decrease in public-assistance cases, the direct distribution, food-stamp, and other Government programs through which foods were made available to needy consumers have been discontinued. School-lunch and school-milk programs are being continued to help assure the Nation's children the foods they need during war. In-plant feeding programs are being encouraged, along with other measures for getting food to war workers whose needs may not be met through existing distribution facilities.

Consumer-education work has been expanded to help people throughout the country adjust their consumption to wartime conditions without sacrificing nutritional standards and to encourage conservation and eliminate the wastes of food to which we became habituated in the years of surplus.

To meet extraordinary wartime demands for food, we have had to step up agricultural production and direct it toward the products most needed. In addition we have had to work out a detailed pro-

gram to procure the necessary foods, to get them in their proper forms, to get them packaged to stand long and difficult journeys, to store them at strategic points, to transport them to the ports, and to deliver them at shipside. This must all be done so as to meet the needs of a large number of agencies in this and in other countries.

Scope of Procurement Work

The Food Distribution Administration is now buying foods for over 40 different programs. These programs now take a substantial part of our total food supply—about 12 percent in 1943, as compared with 6 percent in 1942. In addition, assistance is given in the procurement of food supplies for our military forces. But procurement for all Government needs has been so organized and so coordinated with an active drive for increased food production that our own civilian consumers have suffered minimum hardship. We are eating as well as before the war and can probably continue to do so.

The production and procurement job is bigger and more difficult than over-all figures indicate. Procurement programs require about one-fourth of total food production and much larger percentages of some of the most strategic foods, particularly the protective foods, which must be supplied in abundance to our armed forces, and foods which can be provided in concentrated form to save cargo space.

Of certain special foods, such as dried eggs and dehydrated vegetables, the overwhelming proportion of our production is purchased by the Government. Even on such standard commodities as butter and cheese FDA requires as much as 50 and 70 percent respectively, of the production to be set aside for Government purchase during the flush season of production. The set-asides are so adjusted, however, that takings by the Government are at their highest during the season of heaviest production. Thereby similar supplies are maintained on an even keel throughout the year. Systematic methods of allocation have been developed.

As long as our food supplies were large in relation to demand we could proceed on the basis of meeting all requests. But with demand much larger than supplies, despite a record production of food, a new mechanism had to be set up for dividing, or allocating, our food among legitimate claimants.

Factors in Allocating Food

Requests for supplies are brought together from the Army, the Navy, and other military agencies, from representatives of the British, Russian, and other foreign governments, from the Caribbean and Territorial supply programs, and from the Red Cross. Requirements for United States civilians are likewise carefully worked out. All of these needs are set down 12 months in advance along with careful estimates of supplies that will be available.

The allocations take into account nutritional requirements, the food habits of various groups, the necessity for conserving shipping space, the special requirements of the armed forces for the various rations, and similar factors. There is give and take, up and down the line

on individual food items and substitution of one food for another. The general policy has been to give first priority to the armed forces, second to domestic civilians, and third to our Allies.

Since the allocations are determined from estimated production and supplies, they are made "firm" only quarter by quarter. All "firm" allocations must be met. Every 3 months the supply is reestimated and allocations are squared with expected food income. This procedure, brought to its present form during the past fiscal year, has provided a good working basis for distributing our food supply.

Procurement Operations Concentrated

Actual procurement operations have been concentrated in the hands of two agencies: The Army Quartermaster Corps and the Food Distribution Administration. This has made it possible to achieve high efficiency and to minimize the upsetting effects of large-scale purchase, transportation and storage operations. It has kept Government agencies from bidding against each other for the same supply. It has facilitated purchase of seasonal commodities during the periods of greatest production and permitted minimizing of purchases during periods of low production, when the impact on civilian supply would otherwise be severe. It has also directed Government buying to areas where supplies are most abundant and relieved pressure on civilian supplies in deficit areas. The two agencies have cooperated to avoid local and regional dislocation of transportation and warehousing facilities. Pooling of reserve stocks between the different claimant agencies has increased the flexibility of the procurement operation and reduced the size of needed reserve or inventory stocks.

To implement the allocations agreed upon, various restrictions and regulations have been imposed on the processing and distribution of foods. Food orders have been issued requiring processors or handlers to set aside specified percentages of their supplies for Government purchase. This type of regulation has been applied to butter, cheese, dry skim milk, various fats and oils, lard, canned fruits and juices, canned vegetables, canned fish, meats (now suspended), dry beans and peas, and rice. In the case of certain products processors are required to set aside 100 percent of their supplies, and they can sell into commercial channels for civilian use only on specific release by the Government. This has been required in connection with various dried fruits, dehydrated vegetables except sweet potatoes and carrots, dried eggs, and most citrus-fruit juices.

Various Restriction Orders

To meet Army needs for potatoes during the shortage in the spring of 1943 the Food Distribution Administration prohibited shipments of potatoes except under specific authorization of the Director of Food Distribution and required shippers to offer the potatoes for sale first to a Government agency. In certain cases the Food Distribution Administration has required raw products to be set aside or otherwise diverted into the manufacture of desired processed products. For example, eggs placed in storage during certain periods have had

to be used for drying. Certain varieties of grapes produced in certain areas have been allocated to use for raisins. Fixed percentages of fresh oranges have been set aside to be used for making citrus juices.

Processors and handlers have been restricted to certain percentages of their handlings of other foods during a base period or have been required to obtain authorization to procure them for specified uses. Orders of these types have been applied especially to the various vegetable oils. Such restrictions on the distribution of foods have been imposed only where they are necessary to assure availability of the supplies allocated for Government purchase or other essential uses. As a result it has been possible, with some temporary exemptions, to procure the supplies required for military and lend-lease use.

It was necessary early in the war to ration sugar and coffee. Rationing has since been extended to canned fruits and vegetables as a group; to meats, cheese, butter, margarine; and to shortening and other edible oils grouped together. The point values serve as ration "prices," and the point allowances as ration "purchasing power," which the housewife may "spend" as she pleases among the different commodities in the group. To adjust the purchases of various commodities to the supplies available, the rationing authorities of the OPA change point prices upward or downward. Dried fruits and dry peas and beans were temporarily included in the processed fruit and vegetable group, but were later freed from rationing, simply by adjusting their point values to zero.

The rationing program is administered by the Office of Price Administration, but the War Food Administrator is responsible for determining the foods that must be rationed and the quantities of them that can be made available to civilians.

Controls in Trade Channels

On a number of scarce commodities that would be difficult to ration at the retail level, restrictions or allocations have been imposed on their movement in trade channels. This is the case particularly with imported commodities like sugar, tea, cocoa beans, and spices. Burley and fire-cured tobacco have likewise been allocated. In the case of rice, millers' shipments to the several States have been restricted to a percentage of their shipments in the previous year. Another type of order has been used to limit the use of raw products in making processed foods. Ice cream manufacturers, for example, have been restricted to 65 percent of the milk solids used by them in ice cream manufacture in a base period. The sale of heavy cream has been prohibited. The manufacture of foods for pets has been restricted, and the protein content of these foods limited. Uses of honey and molasses have been restricted.

Compression of Nutrients for Shipping

It was realized early in the war that if we were to ship abroad the foods needed by our allies and our own military forces, we would have to compress nutrients into less space. Accordingly, the Government endeavors to expand the dehydration of foods, and to develop

new food products in concentrated form. Dehydration of such products as eggs, milk, and vegetables reduces their weight to one-fifth, one-tenth, or even a smaller fraction of the weight of the fresh product. Use of soya flour or skim-milk powder, to reinforce soup mixtures or oatmeal permits stepping up their protein content far out of proportion to the increase in bulk. Production of citrus-fruit-juice concentrates and vitamin tablets provide vital nutrients in a minimum of shipping space. Great progress has been made in developing products that can easily be reconstituted so as to make palatable foods. Processes have been improved for retaining the vitamin content of dehydrated products. Methods of preparation and of packaging have been devised that greatly increase the length of time they can be stored. The program of food compression greatly reduces the shipping space required.

As rapidly as the technical problems have been solved, the task of putting them into actual commercial practice has been pushed forward. This has frequently required new plants. Quality improvement in milk, for example, has required a shift from the roller-drying to the spray-drying process. With both milk and eggs, facilities have been developed to the point where the chief bottleneck has been shifted from drying capacity to procurement of raw products.

The vegetable-dehydration industry has been built almost from scratch. Production is now reasonably adequate for war needs except for dehydrated onions. Dehydrated carrots and sweetpotatoes have been released for general civilian consumption. Meat dehydration has presented a more difficult problem, but appreciable quantities of dehydrated pork are now being produced for shipment abroad. Capacity for making edible flour instead of animal-feed meal as a byproduct of crushing soybeans for oil has been built up to over 1½ billion pounds per year, sufficient to make this highly nutritious product available for domestic civilians as well as for export.

Packaging Problems

Another problem has been the development of packages for food shipped abroad. Steel and tin for drums and cans, wood for boxes and barrels, and textiles for bagging have all been scarce. It has been necessary wherever possible to develop paper and fiberboard containers. For Army and lend-lease shipment, containers need to be sturdy and durable. Supplies for Army shipment must be capable of withstanding immersion in salt water and exposure to extremes of heat and humidity. Containers that meet these requirements have been developed and put into production on the required commercial scale. Special problems have been solved, such as the provision of retail-size packages in which dried eggs for English family use can be safely packed at the point of processing, so as to avoid the need of repackaging them overseas.

Shortages of packaging materials, plus the increased requirements for overseas shipment, have made it difficult to meet domestic packaging needs. Strict allocations of tin plate for cans have been worked out with the WPB for the various fruits, vegetables, and other products, which it has been decided should be packed in tin. Use of glass

has been encouraged in canning for domestic use. Essential bagging needs have been met by shifts to materials lighter than those customarily used and by using more cotton. Wooden containers for fruits and vegetables have been scarce, but essential needs are being met with the help of an extensive program to stimulate the saving and re-use of containers.

Cooperation With Industries

The controlled-materials program of the War Production Board has affected all branches of the food industry. The Department has therefore accepted the responsibility of working with the industry on its needs for scarce materials and of recommending to WPB the granting of needed priorities, and at the same time of carefully screening requests. It has leaned heavily on the industry for advice on ways of meeting various problems, and also for assistance in carrying out food orders and other programs.

Through a system of industry advisory committees set up by the Food Distribution Administration representatives of the various sectors of the different trades and industries are brought together for consultation with Government officials. Nearly 80 such committees, each covering one or more commodities, now meet regularly.

Another type of industry cooperation is exemplified by the War Meat Board, which includes representatives of all segments of the packing industry who sit around the table with officials of the War Food Administration, the Army Quartermaster Corps, and the Rationing and Price Control Divisions of OPA. In all cases industry representatives are in an advisory status, but the Government officials are in a position to act promptly upon their recommendations.

Distribution To Improve Nutrition

The food-stamp program was terminated at the end of March, and the general program of direct-relief distribution at the end of May. This change accords with the decrease of food surpluses, and with the simultaneous increase in employment and decrease in the necessity for relief. At the same time, the Department has felt a special responsibility for continuing the school-lunch program. Especially in war it is important that the Nation's children should be adequately fed. With increased employment, fewer families are financially unable to feed their children properly, but there still are many millions of people whose incomes either have not increased or remain below the level necessary to enable them to buy sufficient food.

School feeding has become more important from another standpoint. Many mothers have gone into war industry to take the place of men called to military service, or to help meet our increased program of industrial production. Their children are likely to receive less care. School lunches are an important help in meeting this problem. It is essential to protect children as much as possible from the hardships that wartime shortages may cause.

Congress has appropriated $50,000,000 for continuation of the school-lunch work. The discontinued school-lunch program, which involved direct distribution through State welfare Agencies of foods

purchased by the Government, has been replaced by a locally sponsored school-lunch program, whereby the Food Distribution Administration reimburses sponsors for part of their costs. The reimbursement authorized depends on the number of children fed and on the type of lunch served. Many schools shifted to the new program last spring. All schools that maintain lunch programs are on the new basis now.

The Feeding of War-Industry Personnel

Tremendous movements of population into centers of war activity, both industrial and military, have strained distribution facilities in many areas. Wholesalers and retailers in such places must serve populations up to 50 percent larger than before the war. Meantime, the attraction of war industries and the withdrawal of men for military service have caused a reduction in the number of food establishments, particularly the retail stores. The increased employment of women, including housewives, and the operation of war plants three shifts a day have upset family eating schedules and necessitated more "eating out." This has thrown a heavy burden on restaurants. Shifting the hours when grocery stores are open is a help to many war workers. Workers in heavy industry need more food than less active people, and special measures are needed to assure them the foods they need.

We have only begun to deal with these problems. A program has been undertaken to develop the establishment of cafeterias for workers in war plants, where they can obtain substantial mid-shift meals at reasonable prices. Food over and above their regular rations will frequently mean healthier, happier, and more efficient workers. In its over-all nutrition-industry program, the Food Distribution Administration consults with the War Production Board on plant needs for food and facilities, with the War Manpower Commission, and other agencies on labor and related problems, and with the Office of Price Administration on food supplies and prices in the in-plant and nearby eating establishments. Likewise the FDA is encouraging and supporting local efforts to protect manpower in food wholesaling and retailing in places where the service is inadequate. It is promoting the staggering of store hours and the adoption of practices that minimize manpower requirements. Already the benefits are considerable.

Consumer-education programs have been undertaken to spread a basic knowledge of nutrition and food conservation. Participating are more than 2,600 local and county nutrition committees throughout the country. They advise people how to adjust their food habits to wartime conditions; specifically, how to select the more plentiful foods in substitution for foods that have become scarce, and how to combine, cook, and serve the foods available so as to maintain well-balanced diets.

Our food requirements will continue to increase, but we can hardly hope for further striking increases in production such as those of the recent past. Future increases will principally result from shifts to products that yield more nutrients per acre and per man-hour. It is not possible to get indefinite over-all expansion, but we can get the equivalent by reducing food wastage.

THE WORLD'S FOOD AND AMERICAN AGRICULTURE

The rapid spread of war throughout the world and its accompanying disruption of international transportation as well as of farm production in important agricultural areas has created a situation of scarcity of some food commodities in various parts of the United Nations. In contrast with the epoch of crushing international surpluses of farm products experienced during the two decades beginning with 1920, we are now in a situation where the huge demand for food among the United Nations and the increasing requirements for relief in the liberated areas can be met only by the best efforts of all farmers in all of the United Nations and associated neutrals.

This situation has materially altered the traditional position of the United States farmer in relation to foreign agriculture. From his normal position as a competitor with foreign producers in world markets, the United States farmer has become a cooperator with producers in the other United Nations and associated neutrals in endeavoring to supply a large and increasing demand for food.

Furthermore, it has become evident that these efforts can be most effective only if they are so coordinated as to insure the maximum utilization of farm resources in the various countries of the United Nations. However important when expressed in absolute quantities, the farm products of the United States that can be made available for export comprise only a part of the total food needs of the United Nations and of the areas to be liberated. A similar situation holds for any other of the United Nations. It has become imperative, then, that our efforts on the agricultural front be linked with those of our allies in order to provide the adequate food weapon needed for a successful prosecution of the war.

The need for United Nations cooperation in food production and distribution was realized early in the war and was reflected in a change in emphasis in the work of the Department's Office of Foreign Agricultural Relations, the link between the United States farmer and foreign agriculture. Normally, the work of the Office consists largely of evaluating foreign competition and demand for United States farm products and of investigating and stimulating the foreign production of agricultural products normally imported into the United States. In keeping with war conditions, however, these functions have now been broadened in scope to include current evaluations of world food supplies in relation to need and assistance to other United States agencies in coordinating the production and distribution of food and other agricultural items among the United Nations and associated neutrals.

The difficulty and likewise the importance of obtaining reliable information on world agricultural production and food conditions

have increased under war conditions. On the basis of the preparatory work done in anticipation of the need, however, and with its background knowledge, the Office has been able to keep informed on the world food situation and to assist in developing an effective strategy of food in war.

Europe's Food

As compared with fluctuations in the first 2 years of war, the food situation in the United Kingdom has become more stabilized. The population still depends heavily for its existence and for its power to wage war on food from overseas. But, with domestic supplies greatly increased and with shipments continued from abroad, the country should be in a position to support its present standards of nutrition.

Civilian consumption as a whole is restricted, but the nutritional standard is generally satisfactory. Studies of food consumption by income groups have shown that the authorities have succeeded in raising the nutritional level of the lowest income groups above that of the pre-war period.

In most continental European countries, on the other hand, the trend in food consumption continued downward in 1942–43. The decline from the previous season, however, was not large; in some cases there was even a slight betterment. In Germany the bread and potato rations, which had to be reduced in the spring of 1942, were brought back in October to their previous level. Half of the cut made in the meat ration in April 1942 was also restored, but there was no restoration of the cut in the fat allowance. Winter-kill heavily damaged the rapeseed crop all over central and northern Europe, a damage which contributed to the reduction in the fat rations in April, 1942. Barley had to be used extensively in bread making during 1942–43, as severe winter-kill of wheat and rye reduced the 1942 harvest of these cereals. As a result of the diversion of barley to human consumption and of shortages of other feedstuffs, hog numbers in Germany were further reduced. Meat rations were again curtailed in the spring of 1943.

The food situation in Germany is still considerably better than it was in the comparable period of the first world war, but a downward trend from the earlier years of this war has been clearly apparent for some time. While the food shortage of itself would probably not yet be a major factor in Germany's capacity to wage war, it appears to become more significant in conjunction with recent military developments, especially those that have directly affected the civilian population.

Conditions in Occupied Countries

In France conditions have deteriorated during 1942–43, notably in regard to fats, meat, and bread grains. The extension of the German occupation to all of France, the loss of North Africa, and further disorganization in distribution have been mainly responsible for this development.

The food situation in the Netherlands and in Belgium has shown little change from that in 1941–42. The Netherlands has continued in a measurably better position than France, while in Belgium conditions are considerably worse. Painful shortages have persisted in Norway and Finland, and central Poland remains one of the worst problem areas on the Continent. Conditions in Spain have been unsatisfactory.

Some slight improvement has been reported in the very unsatisfactory food situation of Greece. Famine conditions developed there during 1941–42. Shipments of food through the International Red Cross, larger domestic production, and less unfavorable arrangements with the Axis powers seem to have alleviated the situation, but hunger and distress are still widespread.

Parts of Yugoslavia continue to suffer from food shortages. In the urban centers of Hungary, Rumania, and Bulgaria the restrictions have been maintained; but in the rural districts no grave shortages seem to prevail, despite stricter agricultural controls.

Total supplies of food in Italy as compared with those of the previous season do not seem to have shown much change. But inequalities of distribution continue to work hardships on a large proportion of the urban population. The occupation of a part of the country by the allies, and of another part by the Germans, and the continuance of military operations on the peninsula, tend to complicate the problem.

If fighting continues for any length of time the already unsatisfactory distribution of food in Italy will lower further the food standard of the city population. Interruption of communications is playing an important part in this development. Foodstuffs are badly needed in a number of areas, and the allies are already bringing in supplies for the population of the territory under allied control.

Thus far, food shipments from Italy to Germany have been confined to a few special items such as vegetables, fruits, wine, and some rice; but the occupation of northern Italy by German armies may radically change this situation. As in other occupied countries, the Germans may attempt to feed their soldiers off the land. This would mean a great loss to Italy in basic foodstuffs, since the Germans previously permitted Italy to import wheat and potatoes. The only major loss in food from Italy that the Germans have sustained thus far as a result of the allied occupation is in citrus fruits.

The food situation in Switzerland, Sweden, and Denmark has remained fairly satisfactory. Both Switzerland and Sweden have stepped up domestic output and continue to have access to overseas supples, while Denmark still seems to manage fairly well on its own considerable production.

Average for Continental Europe

Appraisal of food consumption in continental Europe as a whole, exclusive of Russia, indicates that in 1942–43 civilian per capita consumption was approximately five-sixths of the pre-war level, or slightly below that of 1941–42. Large sectors of the populace, including most of the farm population, have scarcely been affected; hence,

this average means that food consumption in other population groups has been curtailed drastically. Considerable differences prevail among individual countries and regions, and millions of people must subsist on as little as two-thirds or even one-half of the pre-war number of calories. Germany's takings of food from other countries have added to the severity of the regional shortages.

As a result of the changes in the consumption of individual products, foodstuffs of animal origin supplied only approximately one-sixth of the total calories consumed in continental Europe, exclusive of Russia, in 1942–43, as compared with over one-fifth before the war. The average supply of total protein was about 10 percent below pre-war level; in animal protein alone the decline was probably as much as one-third. These declines and changes show the extent of Europe's wartime food problem and the magnitude of the effort that will be required to overcome it after the war.

Reductions in food consumption in continental Europe reflect reduced imports as well as reduced agricultural production. These developments have been only partly offset by some diversion of crop production from feed to food uses and by greater reliance on foodstuffs of vegetable origin—which in regard to total energy obtained is a more economical utilization of the products of the soil.

Military developments in 1942–43, such as the allied occupation of North Africa and Sicily, thus far have affected agricultural output and food supplies in enemy Europe only to a limited extent. Elimination of North African phosphate rock supplies will be an increasingly important handicap to agricultural production in the Nazi-dominated areas in 1944.

Food in Russia

Russia suffered a tremendous loss of agricultural and food resources as a result of German invasion and devastation. Roughly 40 percent of Russia's crop area, which included some of her most fertile land and produced grains, oil seeds, sugar beets, potatoes, and fibers, was in the zone of invasion and battle. During the first world war this rich agricultural territory, which normally produces surpluses of food-stuffs for domestic consumption and export, was practically untouched by military operations.

Much of this invaded territory has now been retaken by the Russians; but with wholesale destruction of farm buildings, equipment, and livestock and with shortages of agricultural labor, some time will elapse before this fertile region can be restored to full production. In the meantime the population must be assisted with food, seed, and the many other items needed for the rehabilitation of their farms. Thus a region which normally contributed a large part of the food supply of Russia is now an additional burden on the food resources of the country and probably will continue to be so until the 1944 harvest, at least.

To help meet Russia's food needs, more than 1,300,000 tons of foodstuffs, valued at 373 million dollars, had been shipped under lend-lease arrangements up to June 30, 1943. Our food exports to the Soviet Union up to that date amounted to over a fifth of the total

lend-lease food exports. In addition, we shipped to the Soviet Union during the same period 43 million dollars worth of other agricultural products, or more than 10 percent of such lend-lease exports. A considerable quantity of vegetable and field-crop seed was purchased with lend-lease funds or collected by voluntary contributions and sent to the Soviet Union.

Food and seed shipped from the United States have been of material assistance to the Russian war effort. But in spite of these shipments and the strong effort made by the Russians to expand production in the uninvaded part of their country, the civilian population is on short rations. This is particularly true of the protective types of foods so important for the maintenance of health.

Food in the Far East

The Far East—comprising China, Manchuria, the Japanese Empire, southeastern Asia, the Netherlands Indies, and the Philippines—normally has enough food to provide for its own needs and to export some surpluses. The region ordinarily has export surpluses of soybeans, rice, copra, and fish products, whereas some wheat, dairy products, meats, and fruits are imported. This over-all situation has been materially altered by the war, at least temporarily, as has the normal flow of products among the various countries in the region.

China, normally a food-deficit country, has suffered the worst effects of the war. Her usual large imports of cereals, soybeans, sugar, dairy products, fruit, and fish have now been cut off for a long time. Furthermore, the production of food has diminished in the large segments of the country occupied by the Japanese, and the disruption of transportation facilities prevents the timely moving of products from surplus to deficit areas. These conditions, together with ruthless requisitioning of food supplies by the Japanese, have resulted in hunger and famine in many parts of China. But recent estimates of 1943 harvests in Free China are favorable; an ample supply of food in the unoccupied regions is indicated, although local deficits probably will continue because of limited transportation facilities.

Considered in terms of the territory that it dominates, the Japanese Empire is in a favorable food situation. It has large stocks of rice from its own production and from supplies obtained in southeastern Asia. Large quantities of soybeans, other beans, and some cereals are available in Manchuria, and large stocks of beans, sugar, corn, vegetable oils, and other commodities probably have been accumulated from the Netherlands Indies, the Philippines, and other sources. But the fish supply currently available to the Japaneses has been materially curtailed by shortage of boats and by our naval operations.

A continuation of the favorable food situation in Japan is conditioned largely upon her ability to transport products from the distant territories that she has conquered. But the elimination of these sources would still permit food self-sufficiency within the Japanese Empire, including Japan proper, Chosen (Korea), and Formosa. It would only be with the elimination of Chosen and Formosa as sources of supplies that serious food difficulties would result in Japan proper,

unless she is able to subsist in large part upon food stock piles that may have been accumulated. Ordinarily, Japan proper depends upon food imports for over 20 percent of her population, and large quantities of imported fertilizers are needed to produce food crops for the other 80 percent. Chosen and Formosa furnish much of the rice, sugar, fruits, and other products normally needed in Japan proper.

In the Japanese-dominated territories other than China, including large parts of Asia and the islands of the South Pacific, severe economic rearrangements have been forced upon large populations. Production of rice has been curtailed in surplus areas such as Burma, Siam, and French Indo-China, while deficit areas such as Malaya have been forced to increase their production towards self-sufficiency to save Japanese shipping. The situation in Sumatra, Borneo, and others of the Outer Islands normally dependent upon food imports from Java may be extremely serious because of lack of water transportation and of difficulties in shifting quickly to self-sufficiency in food production.

The Philippines are reported to have been forced to rely upon their own resources, but this probably would not lead to any serious shortages at present. All of the important staples such as rice, fish, meat, fruits, and vegetable oils are normally available in ample quantities in the Philippines.

In Australia and New Zealand, to the south, large surpluses of cereals, meat, dairy products, and fruits are normally produced. Nevertheless, the large demands of the armed forces in the South Pacific as well as from the United Kingdom have necessitated civilian rationing of certain meat and dairy products in both countries.

United Nations' Supplies of Major Food Commodities

The 1943 world food situation in general has been characterized by scarcity of the animal-protein foods, particularly meat and dairy products. This is in spite of the fact that 1943 food production in the Americas and in the United Kingdom and the Dominions was at a record level. In areas now accessible to the United Nations, except for Russia, the total food production and transportation facilities seem adequate to meet the present consumption needs. But because of growing needs for our armed forces and for liberated areas and the pressure of a large civilian purchasing power, 1944 may be characterized by greater scarcities of some foods than was 1943.

The wheat-supply position itself is favorable but transportation difficulties, demands for wheat for nonfood uses, and limited milling facilities may restrict its actual availability in some countries. Wheat for nonfood uses will considerably exceed the quantity entering into international trade in 1943 and 1944 for food purposes. These nonfood uses are for feed, for alcohol and for fuel in Argentina, whose normal imports of fuel have been disrupted by the war and shortage of shipping.

The rice-supply situation is difficult, with Japan occupying areas formerly supplying 95 percent of world exports. If large quantities of rice are required for the European-liberated areas or for the terri-

tories of the Indian Ocean, supplies now available may disappear quickly. Production is being increased, however, in the United States and Latin America.

The present supply of meats available to the United Nations is less than current demand. For 1944 the United States exportable supplies are estimated at about 8 percent above the 1943 level, after allowing for the increased needs of our armed forces and other claimants. The outlook for production in South America as a whole is for approximately the same output as in 1943. In Australia and New Zealand little if any further increases in livestock numbers can be expected, except possibly for hogs in Australia, and Canada is apparently reaching the limit of her meat output. Such additional increases in meat production as may be feasible probably will not ease the situation materially for the duration of the war. To meet new claims, such as relief in reoccupied territories, it will be necessary to adjust meat-consumption rates downward in the major consuming countries.

The supply of fish is short because of war restrictions on manpower, equipment, and fishing grounds. For 1944 efforts will be made to stimulate production, especially in Newfoundland, with the hope of exceeding the 1943 output. This may be inadequate, however, to meet an increasing demand for salted fish for European relief. Meeting this demand may necessitate downward adjustments in present consumption rates elsewhere.

Egg production has increased during the war in the principal producing areas, and supplies have been ample for civilians of the United States, Canada, Australia, and New Zealand. In the United Kingdom and Russia, civilian consumption of shell eggs has been reduced to extremely low levels, but imports of dried eggs have greatly helped to fill the gap.

The supply of fluid milk in non-Axis areas is not adequate for 1943 demand, and consumption controls have been necessary in some countries. Production in the United States during the first half of 1943 was as high as feed and other production facilities would permit, but a great effort will be required to prevent a decline in 1944. A factor in the apparent shortages in dairy products is the large general increase in demand for fluid milk, resulting from larger purchasing power and from shortages of other foods.

The total supply of fats and oils, excluding butter, available to the United Nations in 1944 is expected to be substantially larger than in 1943. If large supplies for liberated European areas are required in 1944, however, the increased supply may be inadequate to fill the demand. In spite of the larger 1944 supply the margin is small, in that unfavorable factors such as bad weather in Argentina or in the United States could quickly change the supply situation, while increased requirements for European relief would at the same time intensify the demand situation.

The supply of sugar available to the United States is ample to meet current needs, with transportation the important bottleneck. The 1944 sugar situation is not expected to be greatly different from that of 1943.

Wartime problems of coffee supply and distribution, as in the case of sugar, have arisen only because of curtailed shipping. Pre-war stocks in the important consuming countries were large, and production has been maintained, except in Brazil, where large surpluses are still held.

International Cooperation in Food Production and Distribution

A review of the world food situation brings into sharp focus the fact that United States food supplies available for export constitute only a small proportion of the food needs of the United Nations and of enemy dominated territories to be liberated. It is well to keep in mind that we in the United States normally import a larger volume of food products than we export. Furthermore, for many important categories of food that we produce in excess of domestic consumption, the part that is available for export constitutes only a relatively small proportion of the total exportable supplies available among the United Nations. Of the total exportable food supplies available to the United Nations, the United States has only 7 percent of the wheat, grain and flour; one-fourth of the fats and oils; one-third of the meats, fish, and rice; and somewhat larger proportions of canned fish and dried fruits, beans and peas.

As increasingly large food demands for reoccupied enemy territories are made upon our food resources, it is obvious that production in the United States will have to be supplemented by an increased production abroad of food commodities that are now in short supply among the United Nations. An effective accomplishment of this objective necessitates a close integration of agricultural production and distribution among the United Nations and associated neutrals, with planning at the international level to avoid costly duplication of effort and waste.

International cooperation in this direction is being actively furthered by the Department in its work for the Combined Food Board, in its collaboration with the agricultural authorities of Canada and Mexico, in its comprehensive Latin American program, and in its consultative and advisory assistance to operational agencies of the United States Government that are engaged in the procurement and stimulation of production of food in other countries.

The Combined Food Board

On June 9, 1942, the President of the United States and the Prime Minister of the United Kingdom created the Combined Food Board "in order to coordinate fully the prosecution of the war effort by obtaining a planned and expeditious utilization of the food resources of the United Nations." The original membership of the Board included the Secretary of Agriculture for the United States and a representative of the Prime Minister for the United Kingdom. On October 28, 1943, the President and the Prime Minister announced a reorganization of the Combined Food Board whereby the Secretary of Agriculture is named as neutral Chairman, Canada invited to appoint a member, and the War Food Administrator designated as the United States member of the Board. The War Food Adminis-

trator has designated as his deputy the Chairman of the United States Food Requirements and Allocations Committee, and will pass upon all domestic and foreign claims for food from the United States; as a member of the Combined Food Board, the Administrator will represent the United States in dealing with international food problems that fall within the jurisdiction of the Board.

The Board is charged with the following responsibilities:

To consider, investigate, enquire into, and formulate plans with regard to any question in respect of which the Governments of the United States and the United Kingdom have, or may have, a common concern, relating to the supply, production, transportation, disposal, allocation or distribution, in or to any part of the world, of foods, agricultural materials from which foods are derived, and equipment and nonfood materials ancillary to the production of such foods and agricultural materials, and to make recommendations to the Governments of the United States and the United Kingdom in respect of any such question.

To work in collaboration with others of the United Nations toward the best utilization of their food resources, and, in collaboration with the interested nation or nations, to formulate plans and recommendations for the development, expansion, purchase, or other effective use of their food resources.

The Board shall be entitled to receive from any agency of the Government of the United States and any department of the Government of the United Kingdom, any information available to such agency or department relating to any matter with regard to which the Board is competent to make recommendations to those Governments, and in principle, the entire food resources of Great Britain and the United States will be deemed to be in a common pool, about which the fullest information will be interchanged.

The United States staff of the Board Secretariat is provided jointly by the Office of Foreign Agricultural Relations and the Food Distribution Administration. The Director of OFAR served as United States Executive Officer for the Board during the first year and a half of its existence.

Through the International Commodity Committees of the Combined Food Board, authorized representatives of the United States, the United Kingdom, Canada and other interested countries are brought together for discussion of the world supply and demand situation for the various agricultural commodities. Surveys are prepared leading to global planning of the food resources available to the United Nations. Through voluntary cooperation and open discussion by the representatives of the operating agencies of the various countries, agreements for the equitable allocation of supplies are worked out, and, where desirable, recommendations are made on the coordination of procurement plans to insure continuity of supplies and to prevent undue competition. Where basic changes in the production and distribution situation are found necessary, the committees formulate recommendations accordingly. More than 75 formal recommendations have been made by the Combined Food Board, and nearly all of these already have received the concurrence of the governments concerned. Among the commodities which have been allocated by the Combined Food Board are fats and oils, salted and dried fish, rice, tea, South American canned meats, dried fruits, ascorbic acid, and fertilizers. Throughout their discussions, the committees consider the economy of transportation and cooperate closely with representatives of the Combined Shipping Adjustment Board to avoid cross-hauling and to meet requirements wherever possible from the closest available source of supplies.

Cooperation With Canada

The need for agricultural coordination was recognized early in the war in our relation to Canada. We and our neighbor to the north have for many years been an important source of agricultural products for the United Kingdom. With the outbreak of the European war, North America being closer to the British Isles than any other important source of British imports, it became vital that the farms of Canada and the United States contribute a larger proportion of the food needed in the United Kingdom. As demands for food for our own armed forces and for lend-lease purposes increased, it became obvious that the joint obligations of Canada and the United States could best be met by uniting our efforts in a coordinated program for the maximum utilization of the agricultural resources of the two countries.

At the outbreak of war in the Pacific, both Canada and the United States were shut off from Far Eastern sources of vegetable oil. This development was met chiefly by an expansion in the production of oil crops, mostly soybeans and peanuts, in the United States. This expansion, however, encroached upon our feed acreage; consequently, arrangements were made in the first instance through the Joint Economic Committee of the two countries by which Canada expanded the production of feed grains to help meet the requirements of our growing livestock production. These arrangements were mutually desirable, but the chief objective of coordinated agricultural effort between the two countries was to supplement one another in providing the food necessary for the war effort of the United Nations.

In order to keep under constant review the mutual problems of agricultural adjustment and commodity movements between the two countries, the Canadian Minister of Agriculture, J. G. Gardiner, and other leading officials of Canada concerned with agriculture and food supplies, met in Washington at the invitation of the Secretary of Agriculture early in January of this year. After reviewing the production goals of the two countries and agreeing on certain adjustments in these goals, the conferees set up a standing agricultural committee of policy officials representing the two countries. This committee has met from time to time and with the aid of technical specialists has formulated recommendations for the coordination of food production in various fields, including feed, meat animals, dairy products, oil crops, protein feeds, peas and beans, flaxseed, and other commodities vital to the war effort.

This wartime cooperation will carry significant benefits into the post-war period, in that we shall undoubtedly find it highly desirable to keep in close touch with our neighbors in meeting post-war problems of agricultural adjustment.

Cooperation With Mexico

A spirit of cooperation has been maintained also between the agricultural agencies of Mexico and the United States. For many years these agencies have worked together in controlling insect pests and in exchanging technical plant material, personnel, and information.

Trade between the two countries has always been substantial, primarily because in the main the products of each complement those of the other. A trade agreement effective in January 1943 is designed to strengthen this mutually advantageous exchange of products.

Leaders in the two countries are exploring the possibilities of expanding Mexican production of complementary agricultural crops that may become the basis for additional post-war trade. Mexico already produces, among other things, kapok, castor beans, henequen, rubber, and candelilla wax, and growing conditions are favorable for the production of pyrethrum, abaca, and citronella.

Need for agricultural products, in short supply, because of the war has resulted in agreements whereby the United States Government has bought Mexico's exportable surplus of certain commodities, including castor beans and other oil seeds, chickpeas, alcohol, henequen, and rubber. As a further wartime measure, Mexican agricultural workers have entered the United States to work on farms, particularly in the West and Southwest.

Both the long-time collaboration and recent wartime working arrangements bring to both countries a fuller realization of the need for continuing and strengthening their agricultural ties.

The Latin American Program

In its program of cooperating with the other American countries the Department has continued to provide them with technical assistance through scientific personnel and other aids. In these activities the Office of Foreign Agricultural Relations serves as a coordinating unit for the Department.

Cooperative experimental stations have been set up under agreements signed with various American republics. Scientific personnel from the United States are assisting these countries in producing crops complementary to ours, such as rotenone-bearing and other insecticidal plants, cinchona (source of quinine), rubber, fibers other than cotton, cacao, and food supplies for the people who produce these complementary products. This program provides materials needed here and promotes greater economic security in the cooperating countries.

Agreements for such work have been signed during the past year with three additional republics—Bolivia, Cuba, and Ecuador. Similar work has been expanded in Brazil, El Salvador, Nicaragua, and Peru, and plans have been formulated for early collaboration with Colombia.

Keystone of the cooperation in Bolivia, Ecuador, El Salvador, Nicaragua, and Peru is the joint experiment station, or production center. In Brazil and Cuba the cooperation takes place through existing agricultural experiment stations. The United States pays the salaries and expenses of North American personnel assigned to these stations, except transportation expense within the cooperating country. It provides certain books, periodicals, and scientific equipment. The other parties to the agreements supply associate technicians, land, buildings, furnishings, hospital service, skilled and un-

skilled labor, medical services, and transportation. The program at each station is supervised jointly by a representative of this Department and a representative of the department of agriculture of the cooperating republic.

The agreement for a cooperative experiment-station system in Bolivia was signed on April 6, 1943, on behalf of the Governments of Bolivia and the United States and of the Bolivian Development Corporation. The United States provides scientists and equipment not available in Bolivia. Bolivia provides associate scientists and other workers, and the Bolivian Development Corporation provides most of the other needed facilities. Two pathologists from the United States are already in Bolivia studying cinchona diseases. Experimental work will center around rubber, cinchona, medicinals, insecticides, vegetable oils, and the production of subsistence foods.

No cooperative experiment station has been set up in Brazil, but important cooperative work has been carried forward through collaboration with the Instituto Agronomico do Norte, at Belem. An economic botanist on the staff of this Department is acting head of the botanical section of the Instituto. He is assisting in a survey of insecticidal plants and in establishing a basic herbarium of economic plants. Another of the Department's scientists has made a trip through the Amazon Valley in search of high-yielding varieties of timbo, a plant which yields rotenone.

On June 24, 1943, the Cuban Government approved a cooperative fiber-research project drawn up by the Government of the United States. It embraces cooperative experimental work in developing and processing various fibers such as henequen, roselle, melva blanca, ramie, sisal, and others. The United States has sent two men to Cuba to cooperate in this work. One of them is studying engineering problems in fiber production and decortication and other mechanical factors in fiber-production costs. The other expert is studying agronomic problems involved in producing fibers in Cuba, particularly roselle, and cooperating with the government and various producers.

The agreement to establish a cooperative experiment station in Ecuador was signed on August 12, 1942, by the Governments of Ecuador and the United States and the Ecuadoran Development Corporation. Each of these parties has one representative on a governing commission. The Ecuadoran Development Corporation has agreed to provide the buildings, hospital furnishings, and similar equipment. In other agreements these facilities have been furnished by the governments concerned.

Research on cacao will play an important part in the program. Diseases known as witches'-broom and pod rot limit the production of cacao and will be studied intensively. Other types of work are also in progress. Over 17,000 rubber seedlings, 50,000 cinchona seedlings, 11,000 seedling cacao trees, about 7,500 *Lonchocarpus* plants, 20,000 derris cuttings, 5,000 hard-fiber plants of 5 species, 9,000 essential-oil plants of 3 species, and 7,000 other plants of 32 species have been planted.

The Governments of El Salvador and the United States signed an agreement on October 21, 1942, to establish a cooperative experiment

station. The Government of El Salvador provided a site at San Andres. The principal projects to be carried on in El Salvador concern the production and processing of fiber, rotenone-bearing plants, and subsistence crops.

An agreement with Nicaragua for the establishment of a cooperative experiment station near El Recreo on the Mico River, a few miles inland from Bluefields, on the Atlantic coast, was signed July 15, 1942. Lands for the station site have been selected near El Recreo. This station is already working on rotenone-bearing plants, medicinals, oils such as coconut oil, and subsistence crops. Experimental planting material of essential tropical plants such as derris and cinchona has been planted.

The cooperative experiment station in Peru was the first of its type to be started. The agreement for it was signed April 21, 1942. The station is located at Tingo Maria, and there are substations at Oromina, on the Muallaga River near Yuramaguas, and at Iquitos. Work at this station is proceeding on cinchona, rotenone-bearing plants, pyrethrum, tea, rubber, and livestock. A tea nursery and two rubber nurseries have been taken over, and a cooperative livestock project as been undertaken. Livestock breeding, pasture crops, supplementary feeding, management, diseases and pests of crops and animals will be minor subjects of research work at the station.

Scientists of this Department have cooperated on surveys of the dairy industry in Colombia, Costa Rica, El Salvador, Honduras, Nicaragua, and Venezuela.

The Office of Foreign Agricultural Relations has cooperated with the Department of State, the Office of the Coordinator of Inter-American Affairs, the Board of Economic Warfare (now comprised in the Foreign Economic Administration), and other agencies, in rendering technical advice, receiving agricultural scientists, and providing in-service training for agricultural officials of other American republics.

A number of countries in the region served by the Middle East Supply Center have been induced to place their agricultural program on a war basis by substituting food crops for industrial crops normally grown. Food crops have replaced a large part of the cotton in Egypt and other countries, and it is likely that this year the region will be self-sufficing for most of its food needs. This represents a material change from last season, when large quantities of foodstuffs had to be shipped to the region, necessitating the use of allied ships that could ill be spared. Several United States agriculturists, working under the auspices of this Department and of the Department of State, are now assisting in the work of the Middle East Supply Center.

In French North Africa large quantities of cereals, dry legumes, wheat, fresh vegetables, fruits, and other food commodities are normally produced for export to Europe. Production has diminished materially however, because of inability to obtain imports of machinery, fertilizers, and other items during the 3 years of Vichy domination following the fall of France. Consequently, it was necessary this year for large shipments of wheat flour and other foods to be sent into the region by the allies. The Department

sent a special representative to the region to determine the measures needed to restore the agriculture to its normal productivity. Potentially, the region can contribute enormously to the support of our armed forces and of civilian populations in nearby reoccupied areas.

Measures are being taken to develop a food program in cooperation with French authorities and make available the machinery, seed, and other items that are needed. The strategic location of the region in relation to present war operations makes it highly essential that every possible effort be directed to restore its agriculture, and particularly the production of those commodities that would otherwise have to be shipped from distant sources. The Department is assisting in this work in a consultative and advisory capacity through its Office of Foreign Agricultural Relations and the Combined Food Board.

Other Foreign Agricultural Cooperation

Another aspect of the work of the Department's Office of Foreign Agricultural Relations is its assistance in the work of international agencies concerned with wartime food programs abroad. Of these agencies, the one that has been the longest in operation since the outbreak of war is the Middle East Supply Center, an official Anglo-American organization headquartered in Egypt. One of its objectives is to minimize the use of allied shipping space for imports of food from the United States and other distant sources during the war and immediate post-war period. The organization works in cooperation with and through the local governments in endeavoring to expand food production to meet domestic needs and later to furnish food supplies to nearby European territories as they are liberated by the allied forces.

Through its Office of Foreign Agricultural Relations, the Department also conducts special studies and serves in a consultative capacity for our armed forces and for United States civilian agencies concerned with foreign agricultural developments generally. These civilian agencies include the former Office of Lend-Lease Administration, Office of Economic Warfare, and Office of Foreign Relief and Rehabilitation, all of which are now comprised in the Foreign Economic Administration. Handbooks on the agriculture of certain European and Asiatic countries have been completed and others are in process of preparation for use by the Military Government Division of the War Department. The results of studies for a number of countries have been made available for use in relief and rehabilitation activities and in operations relating to foreign food procurement and development. In preparation for the United Nations Conference on Food and Agriculture, information was made available on the agricultural production, foreign trade, and food consumption for each of the 43 nations represented at the meeting.

International Commodity Agreements

The time is fast approaching when the United States again will be engaged in peacetime trade in agricultural products. It will be

a period of great opportunity but one also of great responsibility for us. The maintenance of a stable peace will depend in large measure upon the trade relations that may prevail among the various countries of the world after the war is over. Agricultural trade will be particularly important, not only because it forms such an important share of the trade between so many countries, but also because the war has necessitated many marked shifts in the production and international movement of food products.

Adjustment to the post-war period will need to be orderly and planned. There will be first a period of transition when it may be necessary to supply large quantities of food and agricultural raw materials for relief and early rehabilitation in war areas. In many ways this trade will resemble present wartime trade, with emphasis still on supplies to meet the demands of the United Nations and of liberated areas. Following this emergency period and the resumption of world agricultural production at levels that conceivably may be materially higher than the pre-war levels, the impact of large world supplies in international trade may be felt suddenly and markedly for agricultural commodities such as sugar, vegetable oils, fibers, cereals, rubber, and others.

Two alternatives appear to face the United States in its longer time agricultural foreign-trade development. The one involves unrestricted competition for foreign markets, with each country using whatever means it may deem necessary to obtain business at the expense of its competitors. In some respects, the United States is in a favorable position to use forceful methods to gain foreign markets for its farm surpluses and to restrict imports of various agricultural products into our country. Such methods, we all know now, lead to economic warfare between countries. They create bilateral agreements, barter trade, and international enmity; in short, they are the methods, used by the Axis nations, that constituted one of the major factors that led to World War II. A resumption of such tactics in the post-war period would again endanger world peace.

The other alternative is one of mutual agreement and understanding among nations regarding trade. Agreements may be of two general types. One is reciprocal trade agreements with other countries to cover many commodities, both agricultural and industrial. The other is commodity agreements that would deal with specific commodities. There are several agricultural and raw-material commodities, among them wheat, cotton, sugar, coffee, and rubber, that have been characterized by chronic surpluses during the past two decades. There is every indication that these and other commodities may be faced with similar conditions in our post-war period unless preventive steps are taken. Indeed, surpluses problems for certain of these commodities may be even more acute than formerly, in view of the increased production that has been developed in new areas during the war. The production of synthetic rubber in the United States is an example.

A stabilization of our agricultural front on some of these important commodities may do much to check the cycles of boom and depression in our economic life as well as to remove the cause of much international ill will. We have already taken some steps along this line, and

we need to do more soon. Two commodity agreements are now operating on a limited scale—the International Coffee Agreement, effective in the Western Hemisphere, and a Memorandum of Agreement for Wheat among five countries—Argentina, Australia, Canada, the United States, and the United Kingdom. Even on a limited basis, these joint efforts are doing much to correlate action by the countries concerned and to handle problems that arise. Working together and settling differences with other countries around conference tables, rather than by forms of economic warfare or on the battlefield, is our great hope and our great opportunity to make a better world in the days ahead.

UNITED NATIONS FOOD CONFERENCE

The United Nations' Conference on Food and Agriculture got under way May 18 at Hot Springs, Va., and brought together 166 delegates and aides, representatives of the 34 nations and their 12 associate nations.

Three weeks later, after studying the world's food needs and production capabilities, the Conference adopted a document called the Final Act, consisting of a declaration of principles, 33 recommendations and resolutions, and 3 section reports on nutrition, production, and consumption.

For the post-war period, the declaration said, "we must equally concert our efforts to win and maintain freedom from fear and freedom from want. The one cannot be achieved without the other." It pointed out that poverty is the "first cause" of hunger and malnutrition, and urged expansion of both agricultural and industrial production, to provide the purchasing power needed to maintain adequate nutrition for all. The recommendations implied that the present is the best time to prepare for solving the problems of the post-war period.

The document especially emphasized two recommendations: (1) That the governments represented make a formal agreement recognizing their obligation within their own countries, and in collaboration, to raise the levels of nutrition and standards of living of their peoples and agree to report to one another periodically on the progress achieved; and (2) that the governments establish a permanent organization in the field of food and agriculture.

Resolutions called for creation of an Interim Commission. It was suggested that the Commission meet early in Washington to formulate and recommend a specific plan for a permanent international organization in the field of food and agriculture. This Commission is to prepare an intergovernmental declaration which will set forth mutual obligations to raise standards of living and levels of nutrition, to expand and improve agricultural production and distribution, and to cooperate with other nations through the permanent organization.

Committee Reports Outline Task

Eleven working committees at the conference discussed and explored these subjects. They produced reports, resolutions, and recommendations. These documents, issued in three series, dealt primarily with consumption levels and requirements, expansion of production and adaptation to consumption needs, and the facilitation and improvement of distribution.

The Conference placed great emphasis on the necessity for future international organization and collaboration in bringing world pro-

duction and consumption into balance. It drew special attention to the consumer's problems, called for efforts to provide adequate nutrition for all peoples, and suggested adjustments to make this possible, among them, new orientations in production, a far more widespread use of adequate conservation, and a far more widespread use of modern efficient production methods. There was agreement that distribution will be improved chiefly as conditions of international security make possible an expanding and balanced world economy.

The sessions endeavored in many ways to clarify international understanding on the world's food problems.

The proposals adopted underlined the fact that the aims were neither entirely economic nor entirely political. Primarily, it was a meeting of experts in agriculture with a latent realization that the Conference was closely connected with the United Nations' diplomatic strategy, both in post-war objectives and in the development of war aims. This implied purpose received explicit pronouncement on several occasions and also in the Final Act.

Bitter experience with a world in chaos helped to guide the delegates. Some of this experience was economic—drawn from years of agricultural depression and the paradox of poverty amidst plenty. The substance of the British "buffer stock" proposal, for example, was that surpluses would be stored in fat years for distribution in lean years. Other precedents were taken from wartime rationing experience. Precedents of organization existed in the field of international agriculture, especially in the work of the International Institute of Agriculture and of the League of Nations.

In dealing with the major questions of tariffs, trade, and international finance, after the war, the Conference took cognizance of the close interdependence between the level of employment in all countries, the extent of industrial development, the management of currencies, the direction of national and international investment, and foreign food policies.

THE WORLD'S NUTRITION PROBLEM

In line with the declaration of the food conference that "Each nation can achieve its (food) goal only if all work together," this Deparment has attempted to generalize the world's nutrition problem.

Considered in terms of nutrition, foods can be classified in five groups, each of which has a characteristic function. Though they have some overlapping functions, these groupings offer guides to food needs. By combining foods from each of these five groups it is possible to obtain food supplies containing all the essential nutrients. The five groups are:

1. Grain products: Important as inexpensive sources of energy and protein. The lightly milled products are also excellent sources of iron and vitamins of the B group.

2. Fats and sugars: Economical sources of food energy. Some of the fats also carry important amounts of vitamin A. These foods give to diets flavor and satiety value which are highly prized in many parts of the world.

3. Meats, poultry, eggs, fish, legumes, and nuts: Important sources of proteins and certain of the vitamins of the B group. Eggs are sometimes classed separately because of their richness in vitamin A.

4. Milk and milk products: The outstanding economical source of protein of high quality, calcium, and riboflavin. Also important for many other vitamin and mineral elements.

5. Vegetables and fruits: These differ widely in their nutritive value. Special emphasis should be given to the leafy green and yellow vegetables for their vitamin A value; tomatoes and citrus fruits (among others) for vitamin C value; potatoes and other starchy tubers as economical sources of energy and of some of the mineral elements and vitamins.

Relative Position of Main Foods

Supplies of grains are more nearly adequate throughout the world than those of any other food group. In low-income areas, grains supply from 50 to 90 percent of the total calories in the diet. When used in the form of whole grain or lightly milled products, cereals carry important amounts of protein, minerals, and the B vitamins. In highly milled forms, however, such as white rice, low-extraction white flour, degerminated corn meal, cereals do not provide a good diet.

Supplies of fats are insufficient in many countries, especially fats rich in fat-soluble vitamins (for example, milk fat and palm oil).

The supply of sugar is adequate but poorly distributed. Because sugar is compact and stable, areas not adapted to sugar production can readily import supplies. Natural sirups contain minerals and the B vitamins.

The world supply of protein-rich foods is inadequate and badly distributed both geographically and between income groups. The variety of sources, however, (meats, poultry, eggs, fish, legumes, and nuts)

makes it possible for each area to produce the kinds best suited to its capacities and needs. Where feed supplies are ample, livestock production may give the best return; elsewhere, crops may be needed for direct human consumption, and animal proteins are consequently a luxury. With few exceptions, all areas are short of milk and milk products. Fluid milk requires elaborate distribution and processing facilities.

Production of fruits and vegetables should be increased almost everywhere. Bulky and perishable, these products are expensive to transport and difficult to store. It is therefore advisable to produce them in increased quantities near centers of consumption, and to provide facilities for processing or preserving some of the more perishable kinds. All countries face problems in raising the production of fruits and vegetables. This universal need presents different aspects in different places. In some countries the chief handicap is lack of processing and distribution facilities; elsewhere an important obstacle may be overemphasis on one-crop farming.

Farmers can increase or diminish their production of the things they are accustomed to growing more rapidly that they can raise new products or adopt better technical methods. How to grow new crops and use new practices must be learned. Farmers themselves can speed the process by exchanging information and by obtaining the help of technicians. But frequently they need additional production facilities as well as technical instruction. Part of the world job of redirecting agriculture is to make crop-shift facilities available through credit helps, production of suitable machinery, development of distribution systems, and creation of consumer buying power.

Determination of Objectives

National goals or objectives for food production should be determined on the basis both of nutritional needs and of production capacity. In the United States food needs now comprise those of the armed forces, lend-lease, and civilian; production capacity in terms of these needs depends on the efficiency with which we combine relatively scarce facilities, especially labor and machinery. As the war needs increase, emphasis must shift to foods which supply the greatest amount of the needed food nutrients per unit of productive resource. But when the war ends, emphasis will shift back to the costlier items of the diet.

Food, fiber, and livestock goals for the war have been allocated in the United States to regions, areas, localities, and, in cooperation with producers, even down to individual farms. Possibilities of redirecting production through other means, such as contracts with farmers for the production of specific commodities similar to the contracts that processors use in obtaining sugar beets and canning vegetables are being explored. Procedures thus developed in the war effort may be useful in meeting post-war readjustment problems.

One-crop farming often hinders better nutrition. Such farming usually involves heavy peaks of labor requirements at planting and harvest, with wasteful use of labor at other seasons and frequent disregard for the maintenance of soil fertility. Where possible, the in-

troduction in single-crop areas of other crops, especially those for home consumption, and of livestock, usually increases output per man-hour, raises the level of nutrition for farm workers, reduces production costs, and develops better systems of farming. Specialization has attractions, and often has no alternatives, but some areas are more specialized than they need be.

More production of things needed for better nutrition will tend to reduce excess supplies of other things. Greater production of vegetables, fluid milk, hogs, and poultry in the Americas, in northwestern Europe, and elsewhere will decrease the production of certain of the bread grains, of sugar crops, and of other staples. Some of these staples have been chronic sore spots in agriculture. The adjustments indicated, if promoted from both the national and the international viewpoints, would ameliorate the surplus problem throughout the world.

More food for farmers as well as for other groups is an important widespread need. Food consumed on the farm that produces it saves the marketing margin between producer and consumer. Many foods can be produced economically for farm consumption where it is not advantageous to produce them for the market. For the two-thirds of the world's population which lives on the land, adequate nutrition depends in large part upon adequate production for consumption on the farm. Part-time agriculture, which combines industrial employment with food production for family consumption, offers opportunities for better nutrition.

Modern Findings in Nutrition

Recent investigations have shown what foods human beings need to be healthy, and also that the vast majority of people throughout the world are not getting what they need.

Nutritional requirements have now been determined with a fair degree of precision. They show what people need in the way of calories to provide energy, proteins for growth and repair of tissues, and minerals and vitamins for scores of complicated processes in the body.

People whose diets are grossly lacking in these requirements suffer from crippling and often fatal nutritional diseases, like pellagra, beriberi, rickets. Millions throughout the world have these diseases—many even in the countries usually thought of as well-fed.

Many people not grossly undernourished suffer in varying degrees from ill health and failure to realize their possibilities. Liberal allowances of certain nutrients can have marked effects in raising the level of health and well-being throughout life. All of these requirements can be translated into terms of everyday foods, and these in turn into practical meals and menus. The translation shows that far greater emphasis should be put on the so-called protective foods—vegetables, fruits, milk products, and others.

Measured by any modern standard of nutrition, food consumption is deficient in every country. Poverty is one cause; lack of knowledge is another. In fact the world does not produce enough of the foods that are most badly needed to feed everybody well.

It could produce far more.

Moreover, expansion of agricultural production, along with shifts toward the products most needed, would create better conditions for the farmers, who make up the majority of the world's population.

Techniques are available for determining the nutritional requirements of large or small population groups, including whole nations. The requirements can readily be converted into terms of common foods that people buy, and also into production goals for agriculture. This is being done now to some extent and in some areas to meet the urgent demands of war.

The same thing can be done for peace, through definite and concerted national and international action, mutual assistance among nations, and free exchange of information and experience. The goals in each country might vary; the rate of progress would vary; but with a common determination and the full use of modern technical knowledge, steady progress could be made toward a level of well-being for the human race and a level of food consumption higher than any ever previously achieved.

OUR OWN NUTRITIONAL STATUS

Wartime conditions have noticeably affected civilian diets, but how basic and far reaching the changes have been it is still difficult to say. Increased food prices, lack of time for shopping and for preparing food, and transitory food shortages, mean difficulty for many persons in the planning and obtaining of an adequate or even customary diet. On the other hand, many people have higher incomes and are now competing in the market for foods that were formerly out of their reach.

How well we are faring in our national dietary, what our nutritional status is, and how the war is affecting it are matters not yet reliably determined. It should be remembered that changes in nutritional status, as measured by objective tests, generally do not occur rapidly. Undoubtedly wartime conditions have started to alter the dietary of portions of our poplation, but it is still too early to measure and report the changes.

Several studies of nutritional status and diet estimates have been or are being made. These studies, however, concern definite localities and relatively small portions of the population. For example, they cover certain areas in New York City, Tennessee, North Carolina, Pennsylvania, and California. The resulting data do not provide a sufficient basis for Nation-wide generalization.

Gross evidences of malnutrition, such as scurvy, pellagra, and beriberi, are becoming more difficult to find. Obvious malnutrition is being lessened by education, by better distribution of foods, by the use of vitamin concentrates especially pharmaceuticals for the enrichment of food, and by increased earning power in the lower income groups. The studies mentioned, and also the observations of physicians and records of hospitals, bear witness to this effect. Yet many subclinical evidences of malnutrition persist.

The studies show that in certain of the groups as many as one-third of the subjects are below standard in vitamin A status and vitamin C status. About one-fourth of them are below the optimum in bone-building nutrients and in red coloring matter of the blood.

Recent years have seen marked progress in the science of nutrition. Our knowledge of the occurrence and function of nutrients has increased, and we have more objective methods for determining nutritional status. Earlier diagnosis of nutritional deficiencies is possible. Food-composition figures permit a more critical evaluation of customary diets. The recommended allowances of the Food and Nutrition Board of the National Research Council set forth definite measures for estimating dietary adequacy. These and other advances should result in general improvement in diet and health.

Numerous Federal, State, and local agencies promote better dietary practices and inform the public of discoveries in nutrition. The

school-lunch program has a widespread beneficial effect. These programs, along with the increased interest of the public in nutrition, are playing a very important role. Educational progress, however, is necessarily slow, and improvement in diet depends also on the ability of consumers to buy foods. In the low-income groups the gap between theory and practice in nutrition depends more on the economic factor than on anything else.

Gains and Recessions

The civilian food-supply situation is better than previously in several ways—not so good in others. Farmers have raised more food, but total needs have increased. It has been impossible for the farms and the processing and distributing machinery to keep up fully. Military and lend-lease needs are of course compelling needs. But civilian needs and claims are compelling too. Fortunately these are being adequately met. The per capita quantities for civilians of most of the important nutrients are higher than in the 1935–39 period. In nutritive value this year's food supply is higher in several important respects than was the pre-war average. It is better, for example, with respect to protein, calcium, iron, riboflavin, thiamine, and niacin. In all the other nutritionally important factors, it is about the same or a little better.

In fact, if everybody could "eat the averages" our position would be most enviable. No country has, on the average, a better diet, and most other countries are far behind us in their civilian supply. The real problem is distribution, as it was before the war. It is still a fact that a proportion of the population is unable to get a good diet. Though this situation has long existed, we cannot shirk the responsibility for dealing with it. Inadequate diets mean lost working time, and in wartime lost lives.

The British have made greater advances than we in improving the diet of people who before the war could not afford a satisfactory diet. They have equalized food distribution to all classes to a degree that would be hard to achieve here. In *average* consumption the British level is similar to ours, although their diet is less varied and far scarcer in some much-wanted foods. In meat and fat the two countries are at nearly similar levels; we are higher in eggs and fruit and some other foods. If we could improve the diets of our poor people as the British have done, our diet picture would be very favorable.

NEEDED WORLD READJUSTMENTS

Making needed machinery and tools, fertilizers, seeds, and livestock and veterinary, breeding, and other services more readily available can be helpful in redirecting the course of farm production in various countries. These essentials may be needed to speed agricultural rehabilitation and to introduce more efficient technical devices. Crops not previously grown may require additional equipment, along with the provision of better facilities for processing and distribution. This requirement varies enormously in different countries.

More attention should be given to the production of different crops in the regions best suited to grow them. Considerable land formerly devoted to staples could be shifted into production of perishables, for consumption by a growing industrial population as well as by the farmers themselves. Largely, this is a problem in the coordination of national food-production goals with corresponding world goals. As a first step, farmers and agricultural officials in each country could compare their goals with those of other countries and see what a consistent and workable world pattern would be like. This would need to be established of course, on a long-term basis and to include the management of adequate reserve stocks of nonperishable products to even out good crop years with bad.

International Organization Required

Balancing production programs between nations obviously requires an international agricultural organization. Such an organization, as the food conference emphasized, could continuously promote national programs for better nutrition and bring together the current goals of many countries for review and mutual readjustment. It could be of help also in mobilizing technical assistance, equipment, seed, and foundation livestock and in negotiating international arrangements for increased food trade among the nations. In short, it could be the coordinating counterpart of the various national redirection programs.

The greatest opportunity for world-wide production of sufficient quantities of the proper foods is to be found in an extension of modern farm and industrial technology, which at present flourishes in only a small part of the world, mainly in the temperate zones. In varying degrees and forms it can profitably be applied almost everywhere. Technology involves a cluster of ideas, habits, and attitudes, a set of skills, a body of scientific theory and laboratory apparatus, and a certain confidence in the power of human knowledge to solve human problems, and getting it into wider use is a very complicated task. Research is the dynamic factor.

Technical Resources Available

Some techniques increase the production ability of farmers indirectly by making nature produce more abundantly. These rest chiefly on the chemical and biological sciences and deal with (1) improvement and maintenance of soil fertility, (2) improvement of plant varieties and animal breeds, (3) control over diseases and insects, and (4) better feeding of animals. Other technical aids, such as mechanization, directly increase the productivity of the farmers through the substitution (a) of machinery for hand operations and (b) of mechanical for animal power. Machine technology helps in the care of plants and animals, in tillage and harvesting, in hatching poultry, in terracing and fertilization of the soil, in milking cows, in feeding livestock, and in the preparation of feed. In areas adapted to mechanized farming, production of both cereal and animal foods may often be increased by substituting machine for animal power.

Certain conditions retard the wider use of better farm technology. Many farm units are too small to permit the full utilization of either the labor of the operator and his family or of the equipment available. One third of the farmers of the United States, for example, raise less than $600 worth of produce annually. Many of these farmers lack the facilities needed to use their land and labor fully; others, however, have insufficient land.

Tenure and Farming Systems

Many farmers with adequate land do not occupy it long enough to develop an efficient system of farming. Frequent moving results from short-term leases. On January 1, 1940, one-sixth of the tenant farmers in the United States had been on their farms for less than 1 year; less than one-fifth had occupied their farms for as many as 10 years. Many tenants hold their land under year-to-year leases. Although often they occupy the same farm for years, they never know how long they can keep it. Their feeling of insecurity often is an important deterrent to efficient production; it prevents these farmers from undertaking long-term improvement programs and from producing crops and livestock that require several years for fruition.

In many instances tenure adjustments may require merely some improvement in the present situation. Where land remains in large private estates, provision can be made for suitable housing, and opportunities can be given tenants and workers to produce their own food supplies. Family-operated farms should be of sufficient size to utilize the labor of a farmer and his family effectively. Basically, the tenure system should provide security and stability of tenure to the farm operator and adequate housing for farm workers. It also should permit and encourage needed production for use by the farm family. It should diminish dependence on one cash crop, which usually results in insufficient home production of food. Short-term leases handicap many important lines of production and retard improvements in soils, farm buildings, and farm housing. Variable payments on long-term loans can strengthen the hold of farmers on the land.

The conditions under which hired farm laborers work often do not encourage them to be efficient. Many laborers have no stake in the farm business and do not find it possible to rise in their employment. Often, morever, they are underpaid in comparison with urban workers. Many farm workers are poorly trained and are low in energy because of bad health and inadequate housing and food. Too often they have insecure and unstable occupancy and employment. In some areas farm laborers generally work on the farms only a part of the year. The supervision of farm laborers is often not constructive. Sometimes lack of placement services and other handicaps prevent free interchange of labor among producing areas. Wide prevalence of these conditions indicates the need for serious attention to the situation of farm laborers.

EDUCATION AS READJUSTMENT AID

Education of farm people, young and adult, helps to link research and efficient practice on the land, and needs to be expanded everywhere. Programs for extending useful scientific and practical knowledge to farmers have been developed in many nations, notably in the United States, the British Empire, the Union of Soviet Socialist Republics and many of the smaller countries.

In the United States the work is carried on by various agencies within the Department of Agriculture, by State agricultural colleges and high schools, and by some private organizations and institutions. The Office of Information, the Farm Security Administration, the Rural Electrification Administration, and the Extension Service all carry on such work. Extension work in agriculture and home economics, conducted cooperatively by the Federal, State, and county governments, operates largely through full-time agricultural, home demonstration, and 4–H Club (youth) agents.

Agents of the Extension Service work with local groups and leaders at county, community, and neighborhood levels. Local leaders encourage friends and neighbors to conduct demonstrations, adopt improved farm practices, and cooperate with farm organizations, women's home demonstration clubs, and 4–H Clubs of rural boys and girls. Practices proved sound by research, experiment, and local experience are introduced into a county or community through demonstrations. Farmers in the locality and from neighboring communities visit the demonstration farms. Similar methods diffuse knowledge of homemaking. Official publications provide additional information for the use of farmers.

This country's extension work operates in three major fields: (1) Educational; (2) administrative in cooperation given to public programs; and (3) program building and policy formulation through stimulation of local planning projects. It is a vital bridge between research and experiment on the one hand, and farm and home practices on the other. In the United States the connection thus provided brings educational and advisory help to all groups and all income levels in agriculture. The Extension Service cooperates with large and small farm operators—with farmers whose operations are predominantly commercial, and with those more dependent on relative self-sufficiency. It provides broad extension teaching and also a more personalized approach.

Spreading Scientific Knowledge

Basic in the extension idea is the communication of farm science to farm people. Farmers everywhere need scientific help in combatting insect and plant diseases, in improving their crops and livestock, and in reducing their costs of operation. Getting it to them is a permanent extension job. It is a job that depends, moreover, on multitudinous

contacts, since the application of science to farming usually requires action simultaneously by numerous individuals. The extension method of education lends itself well to this requirement; it reaches farmers individually with facts and principles which they can use. In many cases, notably in the battle against plant pests and diseases, the full advantage of science demands a widespread application of its teachings. It isn't enough to have isolated or scattered action. Yet the general use of agricultural science rests on individual education, which moreover, must be up to date and constant. The extension system is the best means yet devised for providing it.

Educational work with farmers has been supplemented through the Farm Security Administration, which seeks to improve the operations of the low-income and smaller farm operators, tenants, and sharecroppers. Local representatives of the FSA help small farmers and their wives to plan their farm and home production programs and to carry them out. Production of garden and livestock products for home consumption and food preservation for year-round use receives much attention. This program has greatly increased the productivity of many small farmers, raised their levels of nutrition and living, and helped them to accumulate capital for acquiring farms and becoming independent farm operators.

Points Needing Additional Emphasis

Experience gained through extension work suggests many possibilities for a wider application of scientific principles to agriculture. There is room for increased emphasis on:

1. Adult and youth programs on problems such as maintenance of soil fertility, growing adapted varieties of seed, animal and plant disease control and insect control, proper use and care of tractors and machinery, and improved farm management.
2. Adult and youth programs to promote improved marketing practices, such as grading, packaging, cooperative selling and buying.
3. Adult and youth programs to encourage the production of ample farm-family food supplies.
4. Programs of education and supervised credit to aid the poorer farm families in adopting improved practices.

Comprehensive and timely economic information is an essential basis for agricultural decisions and actions by farmers, policy makers, and program administrators. Efforts for improvements in world levels of consumption will create many demands for new and comprehensive data. Accurate crop and livestock data will be needed on a world-wide basis, especially for statistics on acreage, yields, crop condition, production, stocks, prices, shipments, prospective demand, production supplies, and feed balances. Special analysis of problems relating to consumption, markets, price differentials, production organization, agricultural finance, and numerous other problems, will be helpful. Such analyses will also be useful in developing plans for maintaining the economic stability of agriculture, for making adjustments in land occupancy, for conserving and developing land and water resources, for distributing food more widely, and for other related lines of action. Provision should be made for extending and coordinating the research and statistical work already carried on.

FARM INTEREST IN WORLD FINANCE

Serious disturbances in the demand and supply situation of farm products would have resulted from the last war and from its aftermath irrespective of monetary and financial policies here and abroad. Yet repeated and violent changes in these policies and lack of coordination among them made matters worse. This experience warns us clearly that more stable monetary and financial conditions will be necessary after this war in the interest of agriculture and of the economy as a whole.

In the "interwar" period, we can distinguish five phases in the progressive monetary and financial disturbance:

1. The post-war continuation of the wartime inflation.
2. The deflationary break in prices in the early 1920's.
3. A combination in the middle and late twenties of protectionistic policies with stimulation of world trade by capital exports.
4. The break-down of these policies at the turn of the decade.
5. The destruction of the basis of "triangular" international trade and the fostering of bilateral and empire trade by exchange control and other measures in the middle and late 1930's.

Effects of Inflationary Financing

Inflationary financing of World War I brought farmers a great increase in the prices of their products and also a substantial improvement in their price-cost relationship. As early as 1917, however, the trend of this ratio turned downwards; the downward tendency became pronounced in the post-war inflation. In the spring of 1920, for example, the index of wholesale prices of nonagricultural commodities (1910–14=100) climbed higher than that of agricultural commodities. Even in 1919, when the purchasing power of farm income was highest, it was only 22 percent above the pre-war level, although the monetary amount of this income was nearly two and one-half times as high as before the war.

In this whole development the chief drawback to farmers was a rapid increase in farm indebtedness. Farmers' debts had shown a tendency to rise before World War I. In the war years this tendency increased; and during the post-war inflationary years farm indebtedness continued to rise sharply. The increased debt burden would have weighed heavily on many farmers even if the prices of their products and their monetary incomes had remained high. When the inflationary price level collapsed, the weight of farm debt became crushing. The effect was aggravated by the fact that the index of prices received by farmers declined by 41 percent from 1919 to 1921, whereas that of prices, interest, and taxes paid by farmers declined by only 17 percent.

Thousands of farmers lost their farms in the depression of the early twenties and many more had to struggle with financial difficulties.

Post-War Crop Expansion

The period from 1921 to 1929 saw a rapid reexpansion of farm production in continental Europe, especially of energy foods such as wheat and sugar. In the earlier part of that period, monetary and financial disturbances hampered the recovery of European agriculture. Simultaneously, however, continued inflation and exchange control gave the farmers in most industrial countries of continental Europe a protected position. From 1925 on, protectionist policies increasingly stimulated Europe's farm production and, conversely, hampered agricultural-export countries that had expanded their production during and after the war.

The full effect of the changed situation, however, was not felt during most of this period, because world trade in general was kept at high levels by extensive lending operations of the United States, the United Kingdom, and a few smaller but financially strong countries. Primarily these loans financed industrial exports; yet because they helped to maintain relatively high levels of employment, they bolstered the demand for foods and other farm products. Countries predominantly agricultural received a large part of these loans, which enabled them to pay for large imports of manufactured goods without expanding their exports correspondingly.

Agriculture in the United States obtained an increase in its cash income and in its purchasing power; but the improvement for many farmers was not large enough to get them out of their financial difficulties. It resulted chiefly from a widening of the domestic market for farm products. Our agricultural exports, after a temporary recovery, decreased from 1924 to 1929 by 34.5 percent and the agricultural proportion of our total exports declined. Weakness in the world market caused a downward trend in the prices of many farm products in the second half of the decade, along with an accumulation of stocks in private and government stockpiles. Boom conditions in many industrial countries and large-scale foreign lending by the financially stronger countries helped temporarily to deceive farmers and the public as to the extent of the disparity between production and consumption of agricultural commodities, but after the collapse of 1929 the problem stood out clearly.

The Deflationary Period

What happened then has lessons for us now. The flow of capital to financially weaker countries, which had begun to diminish in 1928, declined sharply, and almost stopped. Predominantly agricultural countries felt the weight of their fixed charges for interest and principal repayments. Efforts which they made to increase their exports encountered great difficulty. In the fall of 1929, after the collapse of the boom on the New York Stock Exchange, the markets for farm products suffered a heavy blow. Some agricultural countries resorted to currency depreciations as a means of easing the strain, and this action strengthened the downward trend in world prices for farm products. This country suffered particularly, because in those years it maintained its currency at the gold parity.

New disturbing events came in 1931 to upset financial and monetary conditions. A bank failure in central Europe which, in normal times, would have been of only moderate importance, became the signal for an unprecedented international financial crisis. The United Kingdom went off the gold standard, and a wave of currency depreciations followed. Many countries tried to protect their interests by repeated and often excessive tariff increases and by exchange control. But this procedure only aggravated the world-wide depression, in which the prices of farm products again declined more than those of other commodities.

Axis Abuse of Exchange Control

The Axis countries particularly abused exchange control and other administrative devices for regulating foreign trade. Some of the financially weaker agricultural countries had to trade with the Axis on the latter's terms. Our own exports of agricultural products recovered but little. In fact the proportion of agricultural to total exports decreased nearly continuously. In 1938 these exports amounted to only 23.7 percent of total exports as compared with 47.7 percent in 1913, and in dollar value were only 61.4 percent of what they had been in 1913. Farmers in this country would have been in dire straits had the Government not supported the domestic prices of farm products.

This brief review of financial developments between the wars reminds us that many factors contributed to the difficulties of agriculture in the United States and elsewhere. But it shows also that disturbed international financial and monetary conditions were prominent among these factors. This whole experience should be borne in mind in shaping post-war policies. Agriculture has an interest second to that of no other branch of the economy in desiring stable monetary and financial policies for the post-war era. It is not directly an agricultural responsibility to shape the necessary plans, but the agricultural interest in them is tremendous. Farmers here and abroad have a vital stake in the establishment of adequate facilities for assuring monetary stabilization and freedom of exchange among the nations.

Proposals for Monetary Stability

Various proposals have been made for securing international monetary stability after the war. The United States Treasury has offered a plan for a United and Associated Nations Stabilization Fund; the British Government has proposed an International Clearing Union; the Canadian Government an International Exchange Fund. The differences between these plans, though largely technical, include some features important from a policy viewpoint. They are all tentative as yet, and it may be some time before an agreement can be reached among the United Nations. But it is hoped that such an agreement will be achieved; otherwise there will be danger of a recurrence, after the war, of run-away inflations and currency depreciations. Action will be needed to deal with many features of the abnormal situation that will exist at the end of the war, such as provision for a freer

flow of international investment capital and for greater stability of the prices of raw products.

Measures taken by the United States, the British, and other governments for the control of inflation during the war will contribute to the success of action after the war for promoting international monetary stabilization. Effective inflation control now will keep the purchasing-power disparities between the currencies of the various countries within much narrower limits than otherwise would be the case and in that way will simplify post-war monetary-adjustment problems. It will be important to relax the inflation controls only gradually and to harmonize this process with international policies aimed at the reestablishment of monetary stability.

Credit Needs of Farmers in the Reconstruction Period

Farmers, like other producers, will have to rebuild losses of capital caused by wartime strains on their land and equipment. They will need considerable new capital to carry out shifts in production necessitated by changes in the demand situation and to do other things for the restoration of a peacetime economy. In fact the higher the post-war demand for farm products remains, the greater will be agriculture's need for capital. Farmers themselves will be able to provide only part of the needed capital. Hence the continued development of agriculture will depend largely on the availability of credit on satisfactory terms.

The United States farmer will be in a relatively favorable position. He may obtain credit, not only from a wide range of private sources of credit, such as commercial banks and insurance companies, but also from governmental agencies, such as the Farm Credit Administration, the production-credit associations, the Farm Security Administration, and the Commodity Credit Corporation. But even in the United States measures will have to be taken to improve the terms and conditions under which farmers can obtain credit.

In other countries farmers may have great difficulty in obtaining credit on suitable conditions. Lack of credit facilities may retard the modernization of production techniques in poorer countries, and keep farm living standards low. Unfavorable loan terms and the burden of accumulated debts may compel many thousands of farmers to throw their products on the world market at any price. The United States has an obvious interest in helping to improve farm credit conditions in foreign countries, since these conditions react powerfully on world markets and world prices.

Cooperation in Agricultural Field

Suggestions for international cooperation in the field of agricultural credit took concrete form in a report (II–A–13 of 1931) by the League of Nations. Many of these suggestions may still be applicable. The report contained a convention, a charter, and statutes for an International Agricultural Credit Co. Action for the establishment of this agency had to be postponed in the 1930's, because of the financial crisis then, and also because the political situation deteriorated with

the rise of Axis policies and the consequent withdrawal of Japan, Germany, and Italy from the League. Nevertheless, the League continued to stress the need for international farm-credit facilities, notably in the report of the Mixed Committee on the Problems of Nutrition (1937). In addition, the International Labor Office studied the problem of establishing such facilities.

The American Republics have turned their attention to the problem. In 1940 the Inter-American Financial and Economic Advisory Committee recommended the establishment of an Inter-American Bank, with broad powers to extend credits for agricultural purposes. Ratification of this convention is still pending. Nine nations have signed it, with the appended charter and bylaws.

At the First Inter-American Conference on Agriculture, Forestry, and Animal Industry, held in Washington in 1930, a resolution was adopted calling for the preparation of a plan for a pan-American agricultural bank, but, as in the case of the League's proposal of 1931, deteriorating international financial conditions made it impracticable to proceed further with the plans. At the Second Inter-American Conference on Agriculture, in Mexico, in 1942, the project was revived.

The task of preparing a detailed plan was entrusted by the Pan-American Union to the Inter-American Financial and Economic Advisory Committee, which on April 8, 1943, adopted a report. The report recommended that an Agricultural Credit Department be established within the framework of the Inter-American Bank, instead of setting up a specialized and autonomous Inter-American Agricultural Credit Bank.

Recommendations of Food Conference

The United Nations Conference on Food and Agriculture at Hot Springs, Va., gave considerable attention to agricultural-credit problems. The final act of the Conference (p. 38) contains the following statement:

WHEREAS:

1. Capital development and adequate credit facilities are necessary if agricultural production is to be restored, increased, and intensified;

2. Agricultural credit in some countries has frequently been obtainable only at rates which the farmer could not afford to pay;

3. The agricultural communities in many countries have been unable to obtain information on the organization and development of agricultural credit systems in other countries;

4. In some countries full agricultural development has been or may be obstructed by difficulties in providing adequate capital;

The United Nations Conference on Food and Agriculture—Recommends:

1. That every endeavor be made to ensure an adequate supply of credit to agriculture;

2. That to this end full use be made of all types of suitable private, cooperative, and public credit institutions;

3. That the rate of interest be as low as possible and the conditions regarding initial cost, redemption, etc., be as favorable as possible for the borrowers, particularly with a view to helping the small farmer;

4. That, in view of the importance of agricultural credit, its requirements be duly recognized by international action taken as a result of this Conference.

More Production the Final Goal

After the war, the governments of many countries will probably strive to improve the credit conditions for agriculture; possibly international action will also be taken in this field. The scope and character of such action, or of the actions of individual governments, cannot be foreseen. One point, the importance of which is unquestionable, may be stressed. Improvements in the supply and terms of agricultural credit are not an end in themselves but means to assist farmers in their efforts to produce foods, fibers, and other needed commodities.

Hence the opening of new sources of agricultural credit will be of lasting benefit only if the funds made available are used to facilitate improvements and adjustments in both production and marketing such as will assist farmers, nationally and internationally, to shift their output from commodities in chronic surplus to commodities of which larger quantities will be required to raise nutritional standards everywhere.

FARM FINANCE IN THE UNITED STATES

Farm finance exhibits characteristics peculiar to the circumstances that influence food production, farm ownership, and farm income under wartime conditions. Farmers generally are improving their equity position, reducing their mortgage indebtedness, and using their expanded income to reduce their obligations and finance production that normally requires the use of credit.

Farmers' borrowings on non-real-estate security show a tendency to level off. These debt changes reflect improved farm incomes, reduced quantities of supplies and equipment available for purchase, and restrictions on repairs and new construction.

Interest rates on farm loans remain at a low level; and farm bankrupticies, foreclosures, and related forced sales are declining. As noted elsewhere in this report, the increase in farm real estate values which occurred during 1942 continued into 1943. Certain conditions however, tend to mitigate the rise. These conditions include price ceilings on farm commodities; a continuing shortage of farm equipment, supplies, and labor; increased taxes on farm income; and an awareness among farmers of the dangers of going into debt to buy farms at high prices.

This is a picture far different from that which developed during World War I. Farm-mortgage indebtedness increased approximately 39 percent from the beginning of 1914 to the beginning of 1918. The decrease in farm-mortgage indebtedness during 1942, which exceeded 5 percent, was a continuation of a downward trend that had been in effect since 1923. In that year the total farm-mortgage debt reached a peak of $10,785,621,000.

Trend in World War I

During World War I the trend of farm debt not secured by real estate was similar to that of farm-mortgage debt. Farmers increased their personal and collateral loans at commercial banks approximately 56 percent from the beginning of 1914 to the beginning of 1918. The total outstanding was 2,507 million dollars in 1918; it reached a peak in 1920 at almost 3,870 million dollars. After 1920 the total decreased until 1937 to approximately 594 million dollars, or 15 percent of the 1920 figure.

In the 1920's and 1930's various federally sponsored agricultural credit agencies furnished farm credit not secured by real estate. On January 1, 1937, loans held by these agencies amounted to 468 million dollars. Added to the 594 million dollars held by commercial banks on the same date, these loans brought the total to about 28 percent of the 1920 figure. Up to 1942 the total of such loans by commercial banks

and by federally sponsored agricultural credit agencies increased sharply . Thereafter (excluding loans guaranteed either directly or indirectly by the Commodity Credit Corporation) it tended to level off.

Rural-rehabitation loans (not including loans from State corporation trust funds) made by the Farm Security Administration in the 12 months ended July 1943 totaled $95,732,000, as compared with $116,194,000 in the previous year. Principal repayments for the 1943 fiscal year amounted to $115,005,000, about 43 percent higher than a year earlier.

Demand for Various Types of Loans

Wartime production goals and somewhat higher production costs combined during 1943 to increase the demand from farmers for short-term credit through the credit units supervised by the Farm Credit Administration. Credit requirements of farmers' marketing, purchasing, and business service cooperatives likewise were greater. On the other hand, the need for long-term credit to finance the purchases of farms showed a continued decline, and the repayment in full of farm-mortgage loans for the year ended June 30, 1943, was more than double the number in the preceding year.

Of the funds made available for crop and livestock production, the 529 production credit associations loaned during the fiscal year some $502,500,000. This was the peak amount since the organization of these local cooperatives in 1933 and 1934. Loans from the Regional Agricultural Credit Corporation of Washington, D. C.—many of them for high-risk war-essential crops—totaled $53,292,000. The volume of loans made by the emergency crop and feed-loan offices declined about 9 percent, and amounted to $18,691,000. Altogether the Farm Credit Administration's short-term credit loans increased 21 percent over the previous year.

Among farmers' cooperative groups financed, in part, by the 13 banks for cooperatives there was a substantial increase in the number of "war food" plants for the manufacture of powdered milk, dried eggs, concentrated citrus juices, canned and dehydrated fruits and vegetables, soybean products, and other products. Loans by the banks for these and other purposes amounted to 267 million dollars in the year ended June 30—an increase of 33 percent over loans during the fiscal year 1942.

Practically all the loan funds of the production credit associations, as well as the funds from which the banks for cooperatives furnished the major portion of their commodity loans, were obtained from the Federal intermediate credit banks—also a part of the Farm Credit Administration.

The Federal intermediate credit banks, in turn, sold to the investing public a total of $423,230,000 in debentures during 1943 to finance their loans and discounts. These debentures carry no guarantee by the Federal Government as to either principal or interest. The $884,000,000 of credit extended by the Federal intermediate credit banks during the year included loans and discounts for banks and privately capitalized financing institutions to the amount of $106,091,000.

Mortgage Credit Developments

In the field of farm-mortgage credit, the decline in the amount loaned during the year extended to all types of lenders, except individuals. The average size of farm mortgages recorded showed an increase in 1942 and a continued increase in the first 6 months of 1943. The increase in the size of mortgages applied to all classes of lenders with the biggest increase noted in the case of individual lenders.

During the year ended June 30, 1943, the Federal land banks and the Federal Farm Mortgage Corporation received 30,400 loan applications—15 percent fewer than in the previous year. Loans made totaled $80,331,000—a decline of about 17 percent. In the same period repayments by borrowers amounted to 384 million dollars as compared with 239 million dollars the year before.

Because of these large repayments and the relatively small demand for new loans there was a decrease of 14 percent in the amount of farm-mortgage loans held by the 12 Federal land banks and the Federal Farm Mortgage Corporation. This was in line with the general trend noted by the several classes of lenders who reported repayments of from 8 to 14 percent.

The total farm-mortgage debt has thus been reduced below the 1918 level and was estimated at about 6,350 million dollars as of January 1, 1943, compared with a high of 10,786 million dollars in 1923. In World War I the total farm-mortgage debt climbed from 5,826 million dollars in 1917 to 7,137 million dollars in 1919.

The Record of Repayments

On June 30, 91 percent of the farmers with land-bank loans and 89 percent of those with Commissioner loans had their installments up to date. This compared with the percentages 86 and 84.5 respectively, a year earlier. Increased farm incomes were also reflected in an improved record on current payments and in heavier repayments of short-term obligations.

Repayments on production credit association loans were 19 percent greater than the previous year, and repayments by emergency crop and feed loan borrowers totaled $33,189,000 as against $24,362,000 the preceding year. This 1943 figure included $5,690,000 on 1934–35 drought-relief loans and $3,347,000 on loans 10 or more years past due.

Through the "future-payment funds" deposited by borrowers, farmers also are building reserves to meet future installments on land bank and Commissioner loans and real-estate contracts, and purchase-money mortgages. The "nest egg" in these funds was $23,508,000 on June 30 compared with $8,974,000 a year earlier.

The Farm Credit Administration has urged farmers to build up a reserve in war bonds, and to reduce debts or make provision for payment of future installments on loans, so they will be in a position to face the post-war period with greater security. The war bonds can be used as a reserve to pay for needed farm machinery, household equipment, repairs to buildings, and improvement of the

soil. If the farm-mortgage debt is maintained at a reasonable level, interest costs will not be the heavy burden they were after World War I.

Deposits Up in Country Banks

Demand deposits of country banks were 67 percent higher in June 1943 than at the outbreak of the war in December 1941, as indicated by data for country banks (members of the Federal Reserve System) in places of less than 15,000 population in 20 of the leading agricultural States. Since the middle of 1942 the increase in deposits has taken place at a more rapid rate in country banks than in banks for the country as a whole.

Much of the increase reflects a building up of reserves by farmers. Such reserves will be essential for the post-war period, since current farm income partly represents payment for the wearing out of capital equipment and other resources that cannot now be replaced. If farmers in general continue to realize that their current income is by no meals all clear profit, the temptation that may arise among them to utilize their deposits in country banks for the purchase of farm lands at inflated values will be mitigated.

FARM MACHINERY

What the farm war effort owes to farm machinery can be measured best from the increase that has taken place since 1910–14 in production per farm worker in the United States. In products for sale and for use in the farm home the output now is 50 percent above that of the years that immediately preceded World War I. This gain is the result largely of the substitution of machines for man labor and work stock. Other factors, such as the use of better plants and animals and better cultivation of the soil, contribute to the showing; but power machinery is the main cause of this progress. Power machinery, especially the tractor, effects a tremendous saving in both labor and land—in labor because it substitutes the forces of nature for human muscle and in land because it releases acreage formerly required to produce feed for horses and mules.

Employment in agriculture has been declining for 30 years, though farm production has been increasing. In 1940 the total employment was only about 10,585,000 persons, as compared with 12,209,000 persons in 1909. The average size of the farm enterprise handled per farm worker, measured in terms of crop acreage and number of livestock, is now about 20 percent greater than in 1910. This reduction in the farm manpower required can be attributed largely if not wholly to the increased use of machinery. Large wheat-growing States for example employ only a few transient harvesters now; whereas 20 years ago they required many thousands.

Cropland released by machinery from the production of feed for farm work stock exceeds 35,000,000 acres. Considerable pasture land also, which had formerly to provide grazing for horses and mules, now supports dairy and meat animals. Between 1920 and 1943 the number of horses and mules 2 years old and over on farms dropped from 22,386,000 to 12,270,000, while in the same period the number of tractors on farms rose from about 246,000 to 1,900,000. The decline in the number of work stock continues, though at a slightly diminished rate. Acreage in crops on the other hand is rising and in 1944 may be 16 million acres higher than this year. Thus machinery must be spread over still more land.

Machinery Situations Surveyed

Early this year, the Department made a survey of the farm machinery situation against the wartime background of curtailed farm-machinery production, the reduced farm labor supply, and the need for increased farm production. As might be expected, the survey showed the need for greater production of many kinds of machinery and of tractors and tractor-drawn or -mounted equipment in particular.

For one thing, the average age of the 1,900,000 farm tractors was 6.4 years, with 24 percent of them above 10 years. Even during normal times, about 100,000 tractors are required annually for replacements. Furthermore, it is expected that the number of work animals may likely decline by from 250,000 to 300,000 during the year.

In general, the ratio of drawbar power on the Nation's farms, with tractors and work animals supplying practically all of it, was little changed from the level of recent years.

Analysis of the machinery problem really begins with the contrast between the position at the beginning of World War I and the position now. Only a few power machines were on the farms in 1914; horses and mules supplied practically all the power used then for field work and for farm transportation. Farmers had about 22 million of these animals of work age. Even the automobile industry was then in its infancy, and the farm tractor and the farm motortruck were rare. The number of tractors reported on farms in 1915 was only 25,000. Farmers were able, however, to get more; by 1920 they reported the possession of 246,000 tractors. Through increased use of tractors and other farm machines, farmers expanded their production during World War I despite a severe reduction in the farm labor supply.

Position After Pearl Harbor

When the United States entered World War II, farmers could not compensate proportionately for the labor shortages. They already had mechanized their farms heavily; in 1939 there were six times as many tractors on farms as in 1920, and the number of farm motortrucks were seven times greater.

About 1.7 million of our 6 million farms had tractors and tractor equipment in 1943. On the other hand, possibly 1 million farmers had almost no machinery at all, not to speak of tractors. Many of these farmers without machinery, however, were croppers and could get the use of some equipment from their landlords, while others hired machines for particular purposes. Many farmers who do not own tractors hire the use of tractors from their neighbors or do work in exchange for tractor-operations on their farms. Actually the use of tractor-drawn and mounted machines extends far beyond the 1.7 million farms reported to have such equipment. Tractors will furnish nearly 50 percent of the power available for drawbar work in 1943, as compared with less than 5 percent during World War I.

Tractors and Tractor Machines in 1943

The number of tractors and tractor machines on farms in 1943 will be a little above the record level of 1942. But farmers need more of these machines if they are to increase their production in the face of labor shortages and reduction in animal power. The heavy use which the machines must stand, along with the difficulty of making repairs promptly, shortens the life of the equipment, some of which, as mentioned, is getting into the "aged" class. Many kinds of tractor equipment, such as moldboard plows, disk plows, grain drills, and

grain binders, are commonly older than the tractors. Other machines, such as small combines, mowers, windrow pickup balers, row-crop cultivators, and corn pickers, are, on an average, newer. In areas that have had drought years, such as the northern Great Plains and the Mountain States, machinery replacements have been below the average, and much of the tractor equipment is relatively old.

Horse-Drawn Equipment

Purchases of horse-drawn machines, particularly those of the larger sizes, have been declining. Farmers have been slow to replace their horse-drawn equipment, perhaps in the expectation of shifting eventually to tractor-drawn or mounted machines. The number of horse-drawn machines has dropped to the lowest level in many years, and the average age of these implements has climbed to above 15 years in several categories and to 18 and 19 years, respectively, in grain drills and grain binders. Many horse-drawn machines now on farms are more than 30 years old. As a whole, the horse-drawn machines are from 100 to 200 percent older than the tractor-powered machines of the same general type. These facts point clearly to the need for more materials for the farm machinery industry. Farmers will not find it practicable to replace their worn-out horse-drawn implements with new machinery of the same type. They won't have the work stock to pull it. Necessarily they will turn more to the heavier power machines, which will fit the total situation better.

Rubber on Farm Tractors

As currently developed, the farm tractor depends greatly on rubber for its efficiency. Manufacturers have provided a low-pressure tire adapted for use under farm conditions, and more than 75 percent of the general-purpose tractors now run on rubber. The advantages are numerous. Use of rubber tires on tractors allows the machine to be driven readily over paved highways, increases the travel speed, and develops more drawbar power. Briefly, rubber tires on wheel tractors increase the work performed and reduce fuel consumption per acre. Other farm machines, especially combines, develop increased efficiency likewise when equipped with rubber tires. Probably 12,000 long tons of rubber would have been put on new farm machines in 1942 (not including automobiles and motor trucks), had war conditions not restricted the supply.

Plows drawn by rubber-tired general-purpose tractors average 10 percent more plowing per 10-hour day than steel-wheeled tractors. Moreover, farmers tend to use their rubber-tired tractors more, since these machines can serve a variety of purposes. Figures obtained in a broad survey show that tractors with rubber tires tend to be used about 18 percent more in a year than tractors with steel wheels; moreover, the amount of work they accomplish exceeds the performance of the steel-wheeled machines by considerably more than 18 percent. It has been possible so far to keep most rubber-tired farm tractors rolling though manufacturers have had to make most new ones with steel wheels.

Scope of Tractor Operations

Equally important with the increase in the number of farm tractors and complementary machines is their growing adaptation to more operations. General-purpose tractors mounted on rubber tires have revolutionized both seedtime and harvest. Improved in design, reduced in weight, and operated at costs far lower than those of 20 years ago, they have taken over scores of jobs from the preparation of the soil to the gathering of crops.

Even in the cotton, dairy, and potato areas, which still rely heavily on horses and mules for farm power, tractors and tractor-drawn equipment are making rapid headway. In the Great Plains, in the Northwestern States, and in the Corn Belt, such machines provide most of the farm power used. Some facts about actual power-farming methods in various regions will show what is happening better than could columns of statistics.

Tractor farming has reduced the necessity for employing hired labor not only in the Wheat Belt, where this change has been most conspicuous, but also in the Corn Belt, the Cotton Belt, the Northeastern States, and the irrigated valleys of the West. The use of tractors instead of horses and the development of the tractor power take-off in the Corn Belt have been primarily responsible for the adoption of combines and corn pickers.

On tractor-operated farms in the western Cotton Belt, preharvest work on an acre of cotton may take only 5 to 10 hours of man labor and about 4 hours of tractor work. This may be compared with the requirement in the South Atlantic States, where one mule equipment is commonly used. In that area the same preharvest work per acre on cotton commonly runs up to 40 or 50 hours of man labor and 40 to 45 hours of mule work. In the western dry cotton land and the irrigated cotton areas tractor-drawn planters are in common use. It takes only about 0.6 hour of man labor in tractor work to plant an acre of cotton with a two-row tractor-drawn lister planter.

New Power-Machine Operations

Machine planting and machine digging of potatoes, often with tractor power, has developed in the commercial potato areas of many States from the Northeast to the far West. In the Great Plains, the western Corn Belt, the Rocky Mountain region, and the Pacific coast, farmers use tractor power extensively for plowing, seedbed preparation, and seeding. Tractor-drawn drills do about half the country's seeding of small grains. Such drills have largely supplanted horse-drawn drills in the Great Plains, in the Pacific Coast States, and the western Corn Belt. With the same size drill, tractor power can do about 50 percent more work than animal power.

Tractor power has come into extensive use for operating binders for small grain. Combined harvester-threshers, in common use in all parts of the country, are virtually all tractor-drawn. In width of cutter bar the sizes vary from 40 inches to more than 20 feet. The combine-harvester method prevails in the Pacific Northwest, in the Mountain States, and in the southern Great Plains and handles a

considerable acreage in the northern Great Plains, the Corn Belt, and the eastern wheat area. Tractor-drawn machines, principally combines and binders, harvest above 70 percent of the country's total acreage of small grains (wheat, oats, barley, rye, flax, and buckwheat).

Recent developments in the general-purpose tractor have led to a considerable increase in corn cultivating by tractor power. In 1939 tractor-drawn machines did about 30 percent of the corn cultivating. Up to 1925 tractor-drawn cultivators were little used, but the general-purpose tractor has brought them into general popularity. Under favorable conditions, one man with a four-row tractor-drawn cultivator can cultivate about 35 acres in a day.

Tractor-drawn machines now do about 25 percent of the corn harvesting. In the western Corn Belt the use of the tractor power with mechanical two-row corn pickers enables corn harvesting to be done with relatively little labor.

In some areas tractor-mounted mowers have come into extensive use for haying. Mower performance with tractor power averages 50 percent greater than mower performance with animal-drawn equipment. The windrow pick-up baler provides a new job for the tractor. Tractor-drawn and equipped with an auxiliary motor, the windrow pick-up baler, with a four-man crew, can bale 15 to 25 tons in a day.

Machinery and Manpower Interrelated

It is obvious from these facts that the importance of machinery to agriculture goes beyond the mere extent to which machine power has supplanted animal power and covers also the relationship between machinery and manpower. It releases manpower from farm work and at the same time enhances the effectivenes of manpower that remains on the farms. It does so in two chief ways: First, by speeding many farm operations; and second, by lightening farm toil and enabling farm people to use their heads more. In proportion as the manpower available on the farms declines, the necessity of using each unit of it with maximum efficiency will make machinery still more valuable.

Farm Machinery Rationing

Since late in 1942 farm machinery has been distributed to farmers under a rationing system carried out by State and county USDA War Boards. Actually, the rationing procedure is handled by county farm rationing committees, which were set up for this purpose and operate under the general direction of the War Boards.

Because production of new machinery was limited, rationing was instituted to assure that the new machinery that could be produced would get to the farmers who needed it the most and who would make the most of it in producing food. Approximately 75 types of machinery were on the rationed list. State and county quotas were established for each rationed item, and manufacturers were directed to distribute machinery into areas largely on the basis of these quotas.

To obtain a rationed item, the farmer applied to the county farm rationing committee for a purchase certificate; if he could qualify

for a certificate, he then took it to a local dealer who had the machine and made his purchase. Provision was made for an appeal if a farmer was not satisfied with the rationing committee's decision. As experience was gained with this program, entirely new to agriculture, adjustments were made in the rationing procedure late in the spring of 1943 to accelerate the distribution of machinery.

Exchange and Pooling of Machines

Special measures were taken to obtain the widest possible use of existing farm machinery and equipment. Farmers were assisted in forming machinery pools and were urged to exchange machinery as much as possible. A special program was developed to convert a number of steel-wheeled tractors and accompanying equipment to rubber, so that the machinery could be used more extensively on a custom-operated basis. Thirteen thousand new tractors mounted on rubber were produced and rationed principally to custom operators. In general, custom operation of machinery has been given maximum encouragement. In June, at the beginning of the wheat harvest, representatives of the Federal Government, and of State governments, in nine wheat-producing States made special arrangements to facilitate the movement of custom-operated harvesting equipment from State to State.

Output of farm machinery for the 1943 machinery production year, following adjustments in schedules originally provided in the War Production Board order, was at an average of 40 percent of production in 1940. Manufacture of repair parts was set at 67 percent above that of 1940. In addition, a special program was authorized to provide additional harvesting equipment—9,530 combines, 4,460 corn pickers, and 2,000 pick-up hay balers.

Increased Machinery Output Authorized

In the spring of 1943 plans were laid by the War Food Administration and the War Production Board for increased machinery output in the year beginning July 1, 1943. The USDA State War Boards submitted 1944 requirements, machine by machine, for each State. These requirements were based on the farm-to-farm visits in connection with the 1943 farm-plan worksheet. The approved program provided for an average of 80 percent of the 1940 output, with all restrictions removed on production of repair parts. Special measures have been developed by the War Production Board and the War Food Administration to assure delivery of steel and other materials, and component parts such as bushings and bearings, to assure manufacture and delivery of machinery to meet seasonal needs. The 1944 machinery production year began July 1, 1943, 3 months earlier than usual. The advantage in time gained as compared with the 1943 production year should secure production of machinery in advance of its seasonal use.

The Program for 1944

The program for farm-machinery rationing and distribution will be different in 1944. It is impossible to dispense with all rationing or

distribution controls; but the new program goes about as far as conditions warrant towards normal trade distribution methods. First, it aims to get essential machinery where it will do the most good in the 1944 food-production program. Second, it makes it easier for the farmer to obtain available machinery. Third, it looks toward as nearly normal trade relationships as possible among the farmers, the local dealers, and farm-machinery manufacturers.

The improved machinery outlook has influenced the shape of the program. Some serious production difficulties are expected to remain; yet in general farmers can reasonably expect actually to get machinery that is authorized under the current plan. As already mentioned, authorized production averages 80 percent of the output in 1940, which was a better-than-normal production year. Authorized production in 1943 was only half what is authorized for 1944.

More machinery available means more flexibility in the distribution system and less rationing. Under the 1943 program 91 types of machinery were rationed; under the new program only about a third of that number will be rationed, chiefly those most essential in war food production. The huge demand for some types of machinery and the vital importance of some machinery in producing essential war crops make it necessary to maintain some measure of control over certain kinds of machinery.

FARM LABOR

When farmers were planning their 1943 production most of them viewed the farm labor prospects with apprehension. The number of workers from usual sources had decreased; yet the country needed increased farm production. In spite of labor stringencies, however, the record of performance on the farm front to the middle of September indicates that there have been no serious crop and livestock losses due to manpower shortages.

The number of persons reported working on farms during the 1943 planting season was smaller than the number reported for the corresponding season in any of the last 18 years for which data are available. This was in continuation of a general long-time trend. It is important to note, however, that total farm employment on the first of each month from January to July of this year was the lowest on record, from 2 to 3 percent lower than in the corresponding months of 1942, though in this period the demand for farm products was the biggest on record.

These employment figures, however, do not accurately reflect the 1943 farm labor situation. Farmers and their family members worked longer hours, and the composition of the seasonal working force was unusual. It contained large numbers of women, children, old men, townspeople, and other persons not normally a part of the agricultural working force. These people became farm workers for varying periods of time, to take jobs left by workers drawn from the farm labor force by the armed forces and other war work.

Since the beginning of the national-defense program in 1940 to the middle of this year, 2.6 million actual or potential farm workers had left farms, and more than a million others had taken nonfarm jobs while continuing to live on farms. The losses included many younger men, the most highly skilled and the handiest with farm machinery. Even a full numerical replacement, from the sources actually available, would not have been a complete replacement. How much less working power the available labor force represented than the same number of workers of the quality prevailing in pre-war years cannot be measured, but the difference was considerable.

How Needs Have Been Met

The great bulk of this year's increased farm-labor needs has been met through longer hours worked by farmers, their families, and their hired help and through mobilization of local people as farm workers. In 1942 the average length of the work week for agricultural workers was nearly 60 hours during the most active part of the season (June through October). This was 9 percent longer than in the corresponding period of 1941. Further lengthening of the workweek took place

this year. In April, for example, farm workers averaged a 6 percent longer workweek than in April, 1942. Field work on Sundays became a common practice.

A number of important steps were taken by the Government to help farmers meet essential farm-labor needs. The exodus of draft-age workers from agriculture reached such proportions last year that late in 1942 Congress passed an amendment to the Selective Service Act which provided for the compulsory deferment of workers "necessary to and regularly engaged in an agricultural occupation or endeavor essential to the war effort." It supplanted earlier efforts of an administrative nature to halt the drain of essential workers from dairy, livestock, and poultry farms. Selective-service regulations implemented the amendment.

As a result, 1,449,000 farm workers in the 18-to-37-year age group had been classified by July 1, 1943, in the deferred 2–C and 3–C categories. It is probable that by the end of the year between 2 and 2.5 million workers in the present military age group will have been granted deferment on the basis of their agricultural occupation. Moreover, draft deferment of agricultural workers has resulted in some shifting of workers from nonagricultural occupations to agriculture. In fact, by July 1943 the decline in the number of males of military age on farms appeared to have been stopped, and we had about the same number on farms as a year earlier.

Measures taken by the War Manpower Commission have induced registrants in nondeferable occupations, in the 4–F category, and in the over-age group to enter essential occupations and have particularly encouraged men with farm experience to return to the farms. Discharges from the armed forces of men over 38 years of age, conditional upon their assumption of employment in essential occupations, have augmented the farm labor supply. The War Manpower Commission has also issued regulations designed to restrict the movement of hired farm workers to nonfarm jobs.

Positive Labor Program Undertaken

The 1942 experience indicated that while farmers and their families could be depended on to exert themselves to the utmost, a positive labor program is needed to provide adequate numbers of workers at the right time and in the right place. The first step in this direction was the allocation on July 29, 1942, of the sum of $500,000 from the appropriation entitled "Emergency Fund for the President, National Defense 1942 and 1943."

This money was allocated for the purpose of initiating a program to transport workers to assist in providing an adequate supply and distribution of workers for the production of agricultural commodities essential to the war effort. On October 2, 1942, $1,000,000, and on December 15, 1942, $3,000,000 was allocated to the Secretary of Agriculture from the same fund in order to provide farmers with necessary workers.

Because of its previous experience with migratory workers, the Farm Security Administration was called upon to assume the major share of the Department's responsibilities in developing a farm-labor-

transportation program. The first workers were transported from the southern Appalachian region to western New York State early in September 1942. In November, the program was expanded to include year-round workers. Under the experimental year-round program, workers, most of them with families, were recruited in low-producing areas, transported, trained, and placed on high-producing dairy, poultry, and general farms. The United States Employment Service assisted with placements and the United States Office of Education supervised the training program.

Role of the Extension Services

On February 17, 1943, the Secretary of Agriculture directed the Extension Service of the Department and the extension services of the States to assume leadership in mobilizing all local farm-labor resources available in rural areas. This task included the organization of the labor resources of every town, village and small city in the agricultural counties of the United States. The United States Employment Service was given the responsibility of recruiting persons in urban areas for agricultural work.

On April 29, 1943, the President approved legislation (Public Law 45, 78th Cong.) appropriating the sum of $26,100,000 to remain available until December 31, 1943, to be expended by the War Food Administrator for the purpose of assisting farmers to meet their farm-labor needs. Roughly, half of the amount was apportioned among the several States to enable the agricultural extension services, under the supervision of the Administrator, to recruit, transport, train, and place farm workers.

In a number of States where the United States Employment Service had well-developed farm-placement programs, the Extension Service entered into contracts for the continuance of these activities. Because of the need for interstate transportation of workers, $13,050,000 was made available for expenditures by the Administrator. To operate the interstate and foreign phases of the farm-labor program and to assist the Administrator in supervising the farm-labor activities of the extension services, the Office of Labor was established within the War Food Administration.

Organization of United States Crop Corps

To emphasize the essential character and dignity of helping to save needed war crops, a campaign was launched by the War Food Administration to organize the United States Crop Corps. Serving as a part of this activity, but organized into separate units, were the Women's Land Army and the Victory Farm Volunteers. Members of the Women's Land Army were entitled to wear an official uniform.

In the Victory Farm Volunteers program, the War Food Administration and the State Extension Services received important help from the Office of Education, which cooperated with public school systems in recruiting high school boys and girls for farm work during the summer. Preliminary conditioning and training, before the school season closed, toughened up the muscles of these youngsters and pre-

pared them for farm work. State and county extension workers assumed responsibility for intrastate transportation and for the placement of these boys and girls.

Many recruits for farm work, especially those with little or no farm experience, required some training. There was need also for some training of the trainers. Accordingly, special job-instructor training programs adopted from industry's wartime example were provided. It is especially important to have farmers understand the necessity for breaking in new help gradually. Few boys of teen age, and fewer women, can work immediately day in and day out at the harder farm tasks. Yet through balanced apportionment of the labor available, along with skillful job assignment, most farm operations can be so adjusted that production need not suffer even at times when the most desirable type of farm labor is short or not available. Programs for trainers and trainees endeavored to put these principles into practice.

Aid From Many Organizations

To facilitate the local mobilization of farm workers, 650,000 volunteer neighborhood and group leaders cooperated with county agricultural agents in arranging exchanges of labor and labor-saving machinery. Service clubs, chambers of commerce, women's clubs, defense councils, civic organizations, schools, and youth organizations also helped to enlist the services of village, town, and city people. The major part of these local efforts resulted in direct arrangements between farmers and workers and hence are not reflected in placement records.

Recruitment and placement offices report that during May, June, and July, 900,000 workers registered for farm work, 550,000 farmers placed orders for workers, and 1,600,000 placements were made. These included 700,000 different workers who were recruited locally. Of these workers, 250,000 were men, 150,000 were women, and 300,000 were boys and girls.

Interstate and Foreign Labor

Efforts by farmers and their families, together with work performed by nonfarm members of rural communities, were not enough to permit all localities to grow and harvest their crops with the labor available locally. As usual, many workers moved from State to State at their own expense and sought jobs upon their arrival in areas of employment. Tire and gasoline rationing, together with improved industrial work opportunities, however, thinned the ranks of these migratory workers. Furthermore, it was found that workers traveling from place to place on their own initiative could not be relied upon to arrive in specific shortage areas when needed. Consequently it was considered necessary to continue the interstate and foreign farm-labor program initiated by the Farm Security Administration.

From September 1, 1942, to June 30, 1943, a total of 13,063 seasonal workers had been transported from labor-surplus States to States having serious shortages of farm workers. These transported workers were employed in 15 States, chiefly in the Northeast and far West.

In none of the areas to which they were rushed during the harvest season were there any serious crop losses. Of the 3,723 interstate workers transported during July and August 1943, 3,191 were sent north from Mississippi, Arkansas, and Oklahoma to help harvest the spring wheat crop in Montana and the Dakotas; 207 were sent to Ohio from Alabama to do general farm work, and 325 were sent from Oklahoma to Wyoming to help with haying. The workers moved during July and August were recruited by county agents on an agreement that they were to be returned during September so as to be available for cotton picking in their home counties.

The year-round workers transported and placed on farms totaled 5,058 at the end of the fiscal year. These full-time laborers were placed on dairy, poultry, and general farms, and although some gave up their jobs for one reason or another the majority remained to help their employers maintain food production.

Programs for Foreign Workers

At the time the interstate labor-transportation program was being planned, it was recognized that the available supply of American workers would be inadequate to meet the need for seasonal farm workers in all areas. As a result, the State Department acting at the request and with the advice of the Department of Agriculture, reached an agreement with the Government of Mexico which provided for the orderly recruitment and use of Mexican nationals as seasonal agricultural workers in this country. This arrangement, the first of its kind ever entered into by the United States, proved so successful that similar agreements were negotiated this spring with the Governments of the Bahama Islands and Jamaica.

The agreements were designed to protect the interests of both the growers and the workers. The transportation of the foreign workers to and from their native land and between areas of employment in the United States is provided at no expense to them. The contracts which each worker signs with the War Food Administration on the one hand and which each employer signs with the War Food Administration on the other, provide that the workers shall be paid locally prevailing wages in the area for the agricultural work he performs, at not less than 30 cents per hour, and that employment must be provided for at least 75 percent of the working days of the contract period.

Main Features of the Agreements

Workers also are guaranteed shelter, and sanitary and medical facilities of a reasonable minimum standard. They are given shelter in Government-operated farm-labor-supply centers where available or in growers' housing approved by the War Food Administration. Each contract provides that the worker shall be returned to his homeland when his services are no longer needed in the United States and that a specified amount of his wages shall be deducted and deposited to his credit in his native country for payment to him when he returns.

Every effort is made to select for transportation to the United States only able-bodied workers with agricultural experience. Each worker

gets a careful physical examination, and his character is checked by officials of both countries before he is accepted. No individuals are accepted for contract until they have passed the physical examinations. Applicants may be rejected for health reasons or other causes, including inexperience with farm work.

During periods of recruitment, selection headquarters in all three countries have been swamped with applicants seeking an opportunity to do farm work in the United States. At Nassau and Kingston members of the United States recruitment crews were often stopped in the streets by would-be farm workers and asked for special consideration. Even employees of their hotels were eager to come.

Distribution of the Foreign Labor

The first Mexican workers transported under the international agreement left Mexico City September 25, 1942, to harvest California sugar beets, and later were employed in fruits, vegetables, and guayule in that State. Mexicans have also worked in carrots and cotton in Arizona and in sugar beets in Colorado, Montana, Nebraska, Oregon, South Dakota, Washington, Kansas, Idaho, Wyoming, and Nevada.

The Bahamians were first employed in the bean harvest and other agricultural operations in Florida. After they were no longer needed in that State, they were moved up the Atlantic coast to other areas of need, including South Carolina, North Carolina, Virginia, New York, Tennessee, Delaware, and Maryland. In these States they have been employed primarily in the harvest of such essential food crops as asparagus, berries, hay, peas, and beans.

The Jamaicans have worked in tobacco and fruit in Connecticut; tomatoes, potatoes, and hay in Indiana; asparagus in Illinois; sugar beets in Michigan; asparagus and berries in New Jersey; truck crops in New York, Ohio, Wisconsin, Pennsylvania, and Minnesota; sugar beets, lettuce, and onions in Idaho.

As of August 31, 1943, a total of 44,577 Mexicans, 8,828 Jamaicans, and 4,448 Bahamians had been transported to this country for seasonal farm work.

Other Sources of Farm Labor

No source of farm labor has been overlooked. By August 1, farmers had already employed 6,000 Japanese internees, 1,000 inmates of corrective and penal institutions, 1,000 conscientious objectors, 50,000 members of the military service who volunteered for farm work and were given passes for 1 to 3 days, and 6,000 soldiers who were detailed as units by the War Department to help save the spring wheat crop in the Dakotas. In addition, 21,000 man-days of war-prisoner labor was used in June and 63,000 man-days in July.

Wage-Stabilization Authority

On November 30, 1942, the Department was given authority to stabilize the wages of agriculture workers earning less than $2,400 per annum. This authority, based on Public Law 729, 77th Congress, was given to the Department by the Director of Economic Stabilization.

The order transferring the agricultural wage-stabilization function to the Department provides that employers of agricultural labor may

raise wages (up to $2,400 per annum) at their own option unless and until the War Food Administrator establishes specific wage ceilings. This provision was justified in an order of the Director of Economic Stabilization,[1] as follows:

> * * * the general level of salaries and wages for agricultural labor is substandard * * * a wide disparity now exists between salaries and wages paid labor in agriculture and salaries and wages paid labor in other essential war industries, and * * * the retention and recruitment of agricultural labor is of prime necessity in supplying the United Nations with needed foods and fibers * * *.

Up to September 15, 1943, only 3 wage-ceiling orders had been issued by the War Food Administrator. All 3 were based on the recommendations of the California Agricultural Wage Stabilization Board. The first, issued April 14, 1943, established wage ceilings for harvesting asparagus for canning and freezing, in 5 California counties. Reports indicate that this ceiling was quite successful. The second, issued August 24, established wage ceilings for harvesting canning tomatoes in 20 California counties. The third, issued August 26, established wage ceilings on sun-dried raisin grapes in 8 California counties.

The November 30, 1942, order of the Director of Economic Stabilization[2] also provides that "no employer shall decrease wages or salaries paid to agricultural labor below the highest salary rate or wage paid for such work between January 1, 1942, and September 15, 1942, * * *" without the approval of the War Food Administrator.

The penalties for violation of wage-stabilization orders are severe. Violators, whether employers or employees, are subject to a fine of not more than $1,000 or to imprisonment for not more than 1 year or to both. In addition, where wages or salaries have been increased in contravention of a wage-stabilization order, the amount of the salary or wage paid at the increased rate shall be disregarded by all agencies of the Government for the purpose of determining production costs of the employer in relation to price control, income tax returns, or contracts with the Government.

Estimated Requirement for 1944

To insure the attainment of 1944 crop and livestock goals, approximately 3 percent more man-hours will be required above 1943 level. In numerical terms, this means that 121,000 additional workers will be needed in January, 220,000 in April, 438,000 in June, 426,000 in September, and similar numbers in other months.

Although the percentage increase is not great, the absolute numbers are large. The increase means that even greater efforts must be made next year to enlist the aid of nonfarm people. It means that more farmers and farm workers should be shifted from low-producing to high-producing areas to meet seasonal and year-round labor needs. It also means that large numbers of foreign workers will be needed. It means that there is a continuing need for a vigorous farm labor program to help farmers to secure farm workers.

[1] See Federal Register 7 : 10024, ch. VIII, pt. 4001.5b.
[2] See Federal Register 7 : 10024, ch. VIII, pt. 4001.5c.

FERTILIZERS IN THE WAR EFFORT

Our position in fertilizer materials is considerably better than it was during World War I. Lack of supplies from continental Europe has had no important bad effects; in fact our fertilizer tonnage has increased. Official figures show the tonnage of fertilizer consumption rose from 9,240,497 tons in 1941 to 10,005,238 tons in 1942, while tag sales in 17 States for the first half of 1943 record an increase of 12 percent over the corresponding period of 1942. In the first 2 years of World War I our fertilizer tonnage declined; and though it increased after 1916 it had a lower average plant-food content owing to greater use of low-analysis materials. The contrast between the present position and that of 1914–18 appears not only in the tonnage of fertilizer consumption but in the efficiency of the materials. Several low-analysis grades have not been available in the last year or so. This fact, and some preliminary analyses by fertilizer companies, indicate that the average plant-food content of fertilizer materials runs above the pre-war average.

Supplies available have permitted an increased exportation to other United Nations. We have been in a position not only to provide food for the allied countries but to send them means of growing food themselves. This has strengthened them internally and economized shipping. It seems likely, too, that we shall be able, when the need and the opportunity develop, to furnish some fertilizer materials for countries that the Allies will reconquer in Europe. We are sending some already to North Africa. Shipments of fertilizer to countries that have been robbed or damaged will be vital rehabilitation aids, fully as important as direct food relief. This can coincide with adequate provision of fertilizer materials for domestic consumption.

Our Own Fertilizer Needs

Meantime, we shall need an increased supply of fertilizer ourselves. Fertilizer must be applied on more of the acres under cultivation and on more land at an increased rate per acre. Some essential crops need far more fertilizer than they have been getting, particularly forage and feed crops. Feed crops in the chief livestock-producing areas represent a large potential fertilizer requirement. Shifts from cotton or corn to vegetables necessitate an additional use of fertilizer, even in areas that already use fertilizer heavily. Areas where the acreage fertilized is normally small and the rate of application per acre low, such as the Midwest, Pacific coast, intermountain, and west south-central regions, can profitably use tremendously increased quantities of fertilizer materials. Fertilizer for such vital war crops as hemp, potatoes, and some vegetable crops, can return a value that will well repay the cost, and the Department has cooper-

ated with other agencies to make supplies available. The Victory Garden movement requires much fertilizer.

Fortunately, the supply situation is improving. In nitrogen, it is entirely different from what it was a year ago. For example, the production of synthetic ammonia has been increased sufficiently not only for military requirements but for above-normal production of fertilizer material. The ammonia must of course be processed for fertilizer use, but a large amount can be made available readily as nitrogen solution, which can be used to produce ammoniated superphosphate. Some can be turned into ammonium nitrate, which has possibilities for fertilizer. Ammonium nitrate absorbs water readily when exposed in humid areas and if stored for any length of time cakes very easily, but processes are being developed to overcome these difficulties. Total nitrogen supplies for the coming year are encouraging, and increased quantities can be used as fertilizer.

Superphosphate and Potash

Production of superphosphate is increasing. The supply of sulphuric acid is the principal bottleneck, but this problem can be met by adjustments in the movement of the supply and by increasing the output in the shortage areas. Other problems in superphosphate production, such as those involved in the quarrying and grinding of the phosphate rock and in connection with labor and transportation, can be solved more easily. Probably the superphosphate output this year will top last year's record, but it will be less than we can use, if last year's consumption can be taken as a sign. The consumption of superphosphate in 1942 dipped heavily into reserve supplies and used new production later than usual in the season. Nevertheless, we were able to send considerable quantities of treble superphosphate to Great Britain.

Potash production has been well maintained, though the demand exceeds the quantity that can be made currently available. The potash situation is vastly better than it was in World War I, when we depended on imports for practically our whole supply. Our own production is now large; moreover, the distribution is being handled satisfactorily through the diversion of coastwise to rail movement. But industrial and export demand cuts into the supply and necessitates growing some crops with fertilizer grades that contain less potash than usual. This need not involve any decline in the total plant-food content of mixed fertilizer, since the nitrogen proportion can be increased. Actually, the domestic potash supply for agriculture will be reduced only slightly below the 1942 level. It should be kept in mind, of course, that the need for it is increasing.

Organic Nitrogen

Organic nitrogen materials will be available in less than normal quantity for use in fertilizer mixtures this year and next. The feed shortage, especially of high protein feed, sets up an urgent competing demand; edible oilseed meals will be obtainable only in strictly limited quantities for use in fertilizer. Fertilizer mixtures will necessarily

depend more on inorganic nitrogen. Several grades will have a higher nitrogen content than in 1942, and more mixtures will include more than 4 percent nitrogen. The higher plant-food content of the approved grades implies of course that they will contain less filler. Enough nitrogen for direct application should be available for normal demands, though the supply will include some materials unfamiliar to farmers, such as ammonium nitrate and cal-nitro. As long as the feed shortage continues, and consequently the shortage of organic nitrogen materials, dependence on the synthetic inorganic materials must increase.

Fertilizer Distribution

Efficient distribution ranks equally with efficient production of fertilizer materials as a war-food production help. Five main procedures have been adopted: (1) A limited list of approved fertilizer grades for each State; (2) a crop classification which puts the more vital crops in Group A and the others in Group B; (3) a restricted use of fertilizer for nonessential uses; (4) the use of applications for the quantities of fertilizer needed; and (5) full use of the types of materials available, some of which have not previously been much used. In combination these procedures get a much better total result from the supply available than would be possible with an unregulated distribution program.

MIGRATION AND RURAL LIFE

Our years of defense preparation and then of involvement in the war have produced a tremendous migration from farms to cities, towns, and villages. Net migration townward since 1939 has averaged more than 1,200,000 persons annually, as compared with an annual average of 550,000 in the second half and 200,000 in the first half of the 1930 decade. The movement has greatly exceeded the average for any like period during the last 20 years. It may be usefully compared also with the average (650,000) for the full decade of the 1920's, since that was likewise a period of great industrial activity and of heavy out-migration from the farms.

This migration has occurred in all parts of the country, rather than merely in areas with rapidly developing war industries. The migrants have come from the various geographic divisions in roughly about the same proportions as during the early 1920's. There has been some increase in the proportion from the farms of the Pacific and West South Central States, along with some decline in the proportion from the South Atlantic and East North Central States. This is not the pattern that prevailed in the period 1935–39. In those years, which included seasons of severe and widespread drought, the West North Central and West South Central States supplied large percentages of the migrants, particularly from the drought areas. The migration then was largely a flight from distress; now it is a response to opportunity.

So large a movement from the farms has involved some farm abandonment. Among the migrants who previously were actually farming, it has naturally included some concentration of persons from the marginal low-income farms. Some of these farms have gone out of cultivation.

In many cases, however, it has been possible to consolidate them with other farms, and in that way to maintain and even to increase their productivity. Migration of operators from the better farms has seldom involved farm abandonment. The result usually has been the substitution of new operators. But consolidation with other farms has been an important factor, also, to an extent that may affect significantly the average size of farms throughout the country. Partial surveys indicate, in fact, that the average size of farms, which increased 11 percent between 1920 and 1940, is still increasing faster than before the war.

Composition of the Farm Population

Migration townward at the current rate materially changes the age composition of the farm population; specifically, the migration increases the proportions in it of the very young and the very old. Under wartime conditions it also increases the proportion of farm

persons working; and since the number of hours worked per week is greater, there is considerable change in what the farm people do. They have less time, for example, for activities in and around the farm home and for recreation and community programs. School schedules have to be modified, so that children can help in the fields. Pressure of farm work keeps many of the older farm boys out of school for quite long periods. Moreover, the migration changes the sex composition of the farm population and obliges the women to do more of the farm work. It is estimated that the number of women actually engaged in field work on farms in the summer of this year was 900,000 more than 3 years earlier, while 600,000 more farm women had undertaken nonfarm work. Many farm women have insufficient time for household duties, not to mention community activities.

Unquestionably this cityward migration will have long-term consequences, but what they will be depends on many things as yet unknown. Such migration is of course not wholly a war phenomenon; it is partly a normal accompaniment of our growing industrialization. But the movement was retarded in the depression years in ways that might be called abnormal. Obviously, on the other hand, the present movement has abnormal features; it is not free from the danger of getting into reverse when the war is over. If we have a heavy movement back to the land, it will be evidence of economic retrogression and also of a tendency to make agriculture carry more than its share of the relief load. Protection for agriculture against the danger of heavy post-war reverse migration has requirements in industrial and social life which this report cannot discuss; but we should not assume that the problem will solve itself.

Rural Institutions Affected

Meantime, the townward drift affects all types of rural institutions. School officials have difficulty in engaging teachers, especially for the one-room schools. The armed forces and also the war industries draw heavily on the supply of men teachers, and urban school authorities raise the bidding for women teachers. In these circumstances the rural school authorities find themselves obliged to lower the standards for teachers and to issue emergency certificates. They have problems in getting the children transported to and from school. Many small rural schools face decreased enrollment, as well as difficulty in finding teachers. School consolidation, which in other times would be a solution of the problem, is not now possible in many cases, because the school transportation systems cannot be further extended.

Moreover, the responsibilities as well as the problems of the rural schools are increasing. They are being challenged, for example, to increase their facilities for providing vocational training, so that more of our people both teen-age and adult may learn essential war skills. Vocational training has received much attention in rural schools of late years, and many schools have been able to improve and increase their vocational-training facilities. Yet the effort encounters many obstacles, from shortage of instructors to difficulty in getting equipment and schoolroom space. The percentage of the rural schools that provide vocational training is high, and emphasis

on the program is increasing; but it is not an easy program to advance.

Current conditions interfere with rural recreation and organizational activities. The shortage of young men means fewer dances and parties. Shortages of gasoline and of tires cut down the attendance at movies, baseball games, and village functions. Attendance at Sunday schools and churches drops, and some churches lose membership, though most migrating families retain their local church membership. Neighborhood and community activities feel the loss of leaders called away, either into the armed forces or into essential war activities in the larger towns. These handicaps and restrictions, however, do not impair the morale of the rural communities. Farmers are chiefly interested in winning the battle of production, and they fully understand that it necessarily involves many changes from their peacetime ways of living.

Old-Time Cooperation Revitalized

Observers report a revitalization of neighborhood and community cooperation, both among farm people and between farmers and townfolk. Pooling of labor, machinery, and transportation increases. Campaigns to salvage metal, rubber, and fat arouse the cooperative spirit. Rural school youth participates in organized help with harvesting, often with the cooperation of young people from nearby towns and villages. Townfolk often close their places of business for brief periods each week, so as to increase the available supply of emergency harvest labor. Community Victory Gardens, bond-selling campaigns, food preservation, and fire prevention bring community responses. The patterns of cooperation which these activities require are traditional in American rural life, and farmers everywhere are rediscovering their usefulness.

Use Made of Increased Farm Income

Farm people generally are using their increased income in ways that strengthen their own position and also that of the Nation. What they do with it varies with the different income levels; but the use is broadly constructive at all levels. For example, the lower income families usually pay their current and back debts, put more of their own money into their current production, and improve their living standards. In food buying, which supplements home food production on practically all farms, the lower income families buy more and better foods. Also they purchase better work and dress clothes and make minor improvements in their homes. Some low-income families add to their livestock, purchase equipment when it is available, increase their outlay for dental and medical care, and enlarge their contributions to churches and other community institutions.

In the middle-income group much of the increased income goes to pay taxes and debts, to create reserves for future maturities, and to improve farm homes in ways that are possible under war conditions. This group, like the lowest one, increases its outlay also for foods, clothing, medical and dental care, and community activities. Mem-

bers of it frequently have considerable sums left to deposit in their local banks, whose deposits have consequently risen greatly.

Many farm tenants in middle-income groups are looking toward farm ownership, though with a wary eye on the trend of farm land values. Farm owners in this income group are putting money aside against the time when they will be able to buy new farm machinery liberally and to improve their homes with modern plumbing and in other ways.

The upper income families usually do not increase their purchases of food and clothing very much. They emphasize the payment of debts and taxes, buy livestock and second-hand machinery, sometimes at inflationary prices, invest liberally in war bonds, and set aside reserves for spending when durable goods become available again. The potential demand created in this way for new farm machinery, bathroom and building equipment, and other heavy durable goods is large already. Some of these families risk considerable sums in converting their operations to produce for war needs. They are cautious about speculating in land, because numbers of them have a personal memory of the depression that followed land inflation during and after World War I. In fact the memory of this deflation dampens their desire even for higher commodity prices, which they fear might set the stage for subsequent price deflation.

Farmers Like "All-Out" Production

Farmers keenly appreciate the opportunity they have at present to produce abundantly and show keen interest in the discussion of ways to maintain the opportunity when the fighting stops. The philosophy of abundance makes a strong appeal to them. In the war period they want to produce abundantly what is needed for the war effort, and they hope that in the postwar period it will be possible for them to produce abundantly for peacetime reconstruction and permanent well-being. Surveys of farm opinion which the Department has made bring out this fact repeatedly. They show beyond question that farmers are more interested in achieving reasonable security than in getting very high prices temporarily.

Farmers appear in general to be satisfied with present farm prices, though many of them desire more flexibility in the farm price structure, so that the more essential crops may have a greater advantage over the less essential.

CHANGES IN SIZE OF FARMS

In 1940 the Nation's 6 million farms, as enumerated by the census, consisted of 1,061 million acres, or an average of 174 acres per farm. Since 1910 the number has fluctuated between 6 and 7 million. From nearly 7 million in 1935 it has dropped to almost 6 million in recent years. At the same time, the amount of land in farms has increased consistently. These changes have meant an increase in the average size of the Nation's farms. In the early 1930's the trend leveled off, but between 1935 and 1940 the average size gained 19.2 acres. Under war conditions, with great need for maximizing both total production and production per farm operator, the trend is in the right direction. But the changes that have been occurring in the size of farms are not all desirable ones; nor have they necessarily improved the distribution of the Nation's land resources among farm operators.

Two opposite movements have been under way in recent years, with results not wholly beneficial—an increase in the number of very small farms and an increase in the number of very large farms. In consequence we now have fewer farms of about the average size. Between 1930 and 1940, farms of 3 to 19 acres increased 49 percent in number and gained only 6 percent in acreage; farms of 20 to 259 acres decreased 8 percent in number and lost 5 percent of their acreage; and farms of 260 acres and over increased 4.5 percent in number and gained 17 percent in total acreage.

The trends have differed between the major tenure groups. Although the average size of all farms increased 11 percent between 1930 and 1940, the average size of full-owner farms decreased 3 percent. That of farms in other tenure groups increased. Current indications are that the downward trend in the size of owner farms has not continued. Partial surveys since 1940 show that the average size of farms of all tenure groups has increased, that the size of owner-operated farms has increased substantially, and that the average size of tenant-operated farms has increased only slightly.

Influence of the War

Farm operating units are undergoing change from the impacts of the war. Probably some of the changes shown by the latest census data have shifted in intensity and direction. Undoubtedly the movement of farm acreage into large farms has slowed down, and the decline in the number and acreage of medium-sized farms probably has been reversed. The drain upon farm manpower, though now halted, has influenced the remaining operators to take over vacated tenant tracts and small farms formerly operated by owners. But large operators who depend on hired laborers have been cramped by shortages of help. Rather generally, therefore, the vacated lands

have been acquired by well-equipped family farm operators, who are less dependent upon hired labor.

In the current crop year war manpower policies have influenced the size of farm operating units. Not only has the drain of farm operators from the farms been halted, but some migration back to the farms has occurred. Persons returning to the farms as operators have frequently taken up farms that have been abandoned, or parts of larger farms. Thus the movement has increased the number of relatively small farms. Tending also to decrease the average size of farm units is the subdivision of home farms between father and son, a process much speeded up because of the war. These developments, however, should not materially affect the current trend toward larger farms.

THE FLOODS OF 1943

Spring floods in the middle Mississippi basin destroyed or damaged crops extensively in Indiana, Illinois, Kansas, Missouri, Arkansas, and Oklahoma. Shortly after the main flood waters receded representatives of these States estimated that approximately 3,775,000 acres of cropland had been inundated. Subsequent heavy rains increased this figure to approximately 4,000,000 acres. Severe damage to crops resulted also from erosion precipitated by the floodwaters; it appeared that the loss from this cause would equal or exceed the damage on land actually flooded. Much replanting was necessary because of this erosion and heavy packing of the soil by continuous rainfall. Loss of livestock was considerable, especially in the Arkansas River Valley area in Arkansas and Oklahoma.

The Army organized the work of evacuating families and moving livestock and other possessions out of the flooded areas. In addition it carried out health-protection and rehabilitation measures in cooperation with the Red Cross and with State agencies. Quick action in these matters reduced the distress below the level which could have been expected from past experience with floods and their aftermath. Necessary sanitary and other protective measures were in operation almost immediately in all the States affected. For example, the provision of emergency sanitary facilities around flooded homes was among the first jobs undertaken. From the Army the Red Cross obtained tents for homeless families. The Red Cross also established nearly 150 group shelters to accommodate temporarily approximately 40,000 persons and provided food and other necessities during the emergency period.

Along with action to relieve immediate distress the cooperating agencies took steps to facilitate the recovery of farming. They distributed information as to the crops that should be replanted and as to the cultural practices necessary under the prevailing conditions. Under existing authorizations and programs the Department of Agriculture moved supplies of feed into the flooded area and assisted State and local agencies in rounding up seed. In the distribution of seed for farm gardens the Red Cross participated. New fencing was an urgent requirement; for this, and also for farm building materials, the Red Cross obtained a general preference rating, for extension to handlers and users throughout the flooded area. Loan agencies of the Federal Government provided emergency credit.

Requirements in Flooded Areas

Reports from the flooded areas particularized the farm requirements. For example, Oklahoma estimated from a survey of 35 counties that 244,000 acres of cotton, 291,000 acres of corn, 118,000 acres of

peanuts, and 137,000 acres of grain sorghums had been destroyed, not to mention a considerable combined acreage of potatoes, beans, alfalfa, flax, and commercial vegetables. Fourteen of the counties surveyed reported heavy fence damage. One county reported 35 tractors under water. In Arkansas the reports estimated 300,000 acres inundated, much other land damaged by rains, and the feed situation critical. Greatest needs reported from Kansas were: Credit, machinery, labor, some seeds, and some feed. In Missouri, Illinois, and Indiana reports emphasized crop damage, bridges and roads in bad condition, flood damage to thousands of farm homes, and urgent need for machinery, fencing, an building materials.

Representatives of Federal and State agencies met on May 26 at St. Louis, Mo., to consider the flood problem as a whole. They emphasized credits, manpower, machinery, and a high-pressure operational program as the most important immediate needs. Other emphasized requirements were: Allocations of harvesting machinery for soybean acreage as a replacement crop; speedy reconditioning of inundated farm machinery; hard-steel repairs; welding material; materials to permit installation of lights on tractors; feed in the worst flooded areas; and adequate gasoline supplies. The rehabilitation of the flooded areas was dependent also, the conference reported, on the provision of bridge timbers and bridge steel, the quick repair of levees, and the drainage of certain areas.

Action by WFA

To relieve cotton planters whose seedings had been flooded the War Food Administration modified the cotton acreage allotment provisions. It allowed operators of farms which could not be seeded or reseeded to transfer all or part of their allotments to the county agricultural conservation committee for reapportionment. Allotments thus transferred could be used, however, only by the operators who had transferred them. In other words the operators moved with the allotments. Cotton planted on the transferred acreage did not affect the basis for establishing future allotments on the farms concerned. It was thought the plan would not interfere with the attainment of goals for peanuts, soybeans, corn, and other crops.

Handicaps of the late and wet spring caused the War Food Administration to relax provisions of the agricultural-conservation program which prescribed deductions in AAA payments to farmers who failed to plant at least 90 percent of their war crop goals. In areas where hay and pasture goals had been established and in the High Plains area of Texas and Oklahoma, the deductions continued to apply to farms on which the county AAA committee decided abnormal weather conditions had not interfered with attainment of war crop goals. On other farms in the same designated areas and on all farms throughout the rest of the country, the deductions ceased to apply. The purpose of the action was to help offset unfavorable weather conditions.

The floods in the Midwest interfered seriously with cropping programs. Wet and cool weather over large sections of the East delayed spring planting; on the other hand, drought conditions prevailed in

some western areas. Flexibility provided in the areas where hay and pasture goals had been established, along with elimination of the deduction provision in the other areas, aided farmers through the Nation to make necessary adjustments to their changed conditions.

Many Victory gardeners, especially in the Middle West, had their early crops ruined by excessive rains. The Department, State agricultural specialists, and county agricultural agents helped them with advice as to replanting. These authorities advised the gardeners not to replant the destroyed early crops, but instead to put in crops that could still be planted in their normal season, such as tomatoes, snap beans, lima beans, Swiss chard, summer squash, peppers, eggplant, sweet corn, and sweetpotatoes. As a rule it was too late after the floods receded to put in spring crops of potatoes, peas, early cabbage, spinach, and lettuce. Gardeners who followed this advice partially overcame the handicap of the unlucky start.

Loans To Restore Flood-Damaged Farms

Flood restoration loans designed to enable farmers to get their flood-damaged farms back into production were authorized in 314 counties in 12 Midwestern and Southern States. Loans were made from a special $15,000,000 fund made available by Congress for this purpose in the Second Deficiency Act of 1943. Administration of the loan program was by the Farm Security Administration.

Rain That Caused the Floods

The rainfall that produced this disaster fell during a 14-day period from the 7th to the 20th of May over an area from Lake Huron on the northeast to central Texas on the southwest. It involved central Michigan, southwest Wisconsin, the south half of Iowa, southeast Nebraska, eastern Kansas, all of Illinois and Indiana and Ohio, most of Oklahoma, Arkansas, and Missouri, north-central Texas, northwest Mississippi, west Tennessee, Kentucky, and western Pennsylvania. The rainfall, as recorded by the Weather Bureau, varied from less than 1 inch in the Texas Panhandle to nearly 14 inches in southwest Missouri. The heaviest and longest rainfall, that which caused the historic flood stages, occurred in west-central Indiana, southern Illinois, most of Missouri, northwest Arkansas, northeast Oklahoma, and southwest Kansas. Rains of over 10 inches fell on the watersheds of the lower Illinois River; the upper Wabash; the Meramec, Osage, and Gasconade, in Missouri; the Neosho, the Arkansas, the lower Washita in Oklahoma; and the upper White River, in Missouri.

These storms resulted from the formation of a low-pressure trough between two persistent high-pressure air masses—one warm and moist, centered off the South Atlantic Coast; the other cold and dry, occupying all the northwest third of the United States and extending into Canada. Finally, on May 20 and 21, the pressure of the heavy cold air from the Northwest became high enough to break through the low-pressure belt and dissipate the concentration of rainfall. Thereafter the rainfall was scattered over a much wider area, and the dispersion of it allowed the flood flows to subside. This entire wet period,

according to the Weather Bureau, was very similar in origin to that which produced the Ohio River floods of January 1937. Fortunately, however, the Ohio contributed very little to this flood.

Similar floods, and some even more destructive, have occurred frequently over much of the same area. Floods in the Mississippi Valley were serious in 1927, 1928, 1936, and 1937. The chances of future floods of the same or greater magnitude are unfortunately as great as ever. It is not enough simply to repair and restore losses of this one flood. There is a far larger and far more complicated task ahead.

Legislation Indicates Control Requirements

Existing legislation indicates the kind of flood-control measures that will be required to avoid or to minimize such disasters in the future. The Flood Control Act of 1936 recognizes that such floods are of more than local interest and concern the Nation as a whole. Some of the projects initiated under this act were completed or well along by last spring. They helped to lessen the flood damages. For example, the Wappapello Dam in Missouri, the Sardis Dam in Mississippi, the Grand River Dam in Oklahoma, and other structures demonstrated their usefulness. But we have a long way to go, as floods of recent years have shown. They have driven home two outstanding lessons.

First, it is apparent that channel improvements, such as levees and floodways, cannot alone provide adequate protection. Many levees failed in the 1927 and 1936 floods; and despite considerable widening, raising, and strengthening of levees since then, serious failures of these engineering works occurred in 1943. They helped but did not control the flood. Flood-control engineers drew attention to this fact. The Chief of the Corps of Engineers stated publicly that the only effective way to control floods on the Mississippi River is to build a series of storage reservoirs over the entire Mississippi drainage basin from the Rockies to the Alleghanies and to operate them as one integrated system.

Multipurpose Reservoirs

In humid areas less than half the runoff from rainfall can be depended upon for regular use. Only by storing flood discharges in reservoirs can engineers exercise reasonably effective flood control and at the same time meet demands for municipal and industrial water supplies, for power, navigation, pollution control, and recreation facilities. Reservoir storage capacity for the United States as a whole has grown from about 5,000,000 acre-feet in 1885 to nearly 150,000,000 acre-feet in 1940. Of this, 85,000,000 acre-feet, or over 58 percent of the total increase, has been developed since 1932.

Prior to 1932 most reservoirs were built for a primary purpose, generally for water supply. These reservoirs included a very large number of small reservoirs under 20,000 acre-feet each, the combined capacity of which probably amounted to only a few million acre-feet. Located mostly on small streams, they had only a minor effect on the

run-off from large basins. Subsequent construction emphasized the large multipurpose reservoir; and today the capacity of such reservoirs exceeds that of all other types built to date in the United States. In the Mississippi River Basin, flood-control storage represents one of the major reservoir uses.

Sediment Damage Problem

The second lesson driven home by the recent floods is the need for paying more attention to the sediment-damage problem. Sediment damage is often more lasting that that caused by excess water alone; it takes land out of use for periods ranging from several years up to many decades. Bottom lands covered with debris, gravel, or other infertile materials become useless for crops and, in many cases, even for pasture. Swamping of bottom lands by flood-borne deposits creates problems that necessitate costly drainage improvements; and the scouring out of fields, or the cutting away of strips of land adjacent to stream banks, represents a dead loss to the Nation's productive capacity.

But reservoirs will only partly alleviate these problems. Sediment originates in erosion from sloping lands. This erosion must be controlled; otherwise sedimentation will lessen the efficiency of storage reservoirs and run into main river channels from side drainages below the reservoir sites; it will also damage the bottom lands of tributary streams not suited to engineering structures.

Storage reservoirs can be made large enough to continue in operation for long periods despite high sedimentation rates. But it is often difficult to find enough suitable dam sites to provide the extra capacity desired and at the same time to avoid taking valuable, heavily populated agricultural lands wholly or partially out of use for the reservoirs. Hence the control of flood flows in the Mississippi Valley by building reservoirs far downstream, on the large tributaries of the Mississippi, falls short of a wholly satisfactory solution of the problem. It costs more land than the Nation can afford for this purpose and creates social and economic problems incident to the dislocation of flood-plain families and communities. Moreover, the search for substitute agricultural land leads to the uplands, where usually crop yields average lower and the danger of erosion is greater.

Adequate, balanced flood protection to all downstream interests—agricultural as well as urban and industrial—requires reservoirs located so as to affect the smallest possible acreage of fertile bottom land and cause the minimum dislocation of people and communities. To assist in achieving this objective we may find it profitable to look upstream more than we have in the past and give greater study to more small reservoirs on the smaller tributaries. The direct or first costs of small reservoirs per acre foot of water stored will be comparatively large; but the total acreage of agricultural lands flooded out by this construction may represent less of a strain on the Nation's economy. There may also be lower social costs in population and community readjustment. Such dams can serve multipurpose uses as well.

Action of Various Kinds Needed

Flood prevention, however, cannot be achieved by any single means. Levees and other channel works, alone, have been found wanting. Reservoirs alone cannot assure fully satisfactory channel conditions below them under all conditions of rainfall and stream flow; moreover, the reservoirs themselves must be protected against sediment from the watershed lands above. Loss of reservoir capacity by sedimentation is not necessarily a slow and uniform process. Certain types of rainfall, like "gully washers" or thunderstorms of high intensity, sometimes cause severe and extensive erosion and high sediment rates immediately. Small domestic water-supply reservoirs have lost half or more of their capacity from single storms. Ultimately, the long-run effectiveness of reservoirs in storing and releasing floodwaters depends materially on the proper use and management of watershed lands. Nothing short of a watershed-wide approach, with river works and upland measures combined, can assure maximum protection from flood and sedimentation damage.

In the Flood Control Act of 1936, Congress definitely provided for watershed improvement and management in a comprehensive Nation-wide program. Under the authority of that act, the Department of Agriculture has made many investigations. Detailed surveys have been made of the watersheds of the Little Sioux in Iowa, the Yazoo River in Mississippi, the upper St. Francis in Missouri, and the Washita River in Oklahoma, all tributaries of the Mississippi in the general area that experienced floods this year. Preliminary examinations have been made on a number of other watersheds in the area.

Findings of the Department

These investigations have borne out the findings of the Department from experimentation, research, and observation on plots and small watersheds. They show that a direct and definite connection exists between watershed conditions and land use practices upstream, and the flow of storm runoff and erosion onto flood-plain lands downstream. They show that proper management and the protection of crop, pasture, and forest lands by means of conservation measures and practices have a definite retarding effect on surface runoff and the loss of soil by erosion, and that these reductions in turn will bring about decreases in flood flow and sedimentation rates. The investigations also show, however, that these various effects are not uniform as between watersheds or as between the different segments of the same watershed, but vary considerably in degree depending upon the character of storms, the seasons and the depth and other characteristics of the soil, and other factors.

The total area covered by the Department's surveys and preliminary investigations in the area covered by the recent flood-producing rains amounts to over 101,000 square miles, or roughly one-third of the total area affected. Flood-plain lands subject to damage in these watersheds amount to over 8,900 square miles. About 75 percent of this area, or some 4,300,000 acres, are used for crop production. Acre

for acre, such bottom land has a productive capacity greatly exceeding that of the uplands. Floods upon it take heavy toll.

Major floods occur on the flood-plain lands of these investigated watersheds in the recently flooded area anywhere from once in 30 years to once in 5 years. Moderate and minor damaging floods occur from twice to 15 times each year on the average, especially on the smaller tributary streams. On the Wabash, for example, crop-season floods occur once every 3 to 4 years; one-quarter of the average annual damage occurs in spring when crops are newly planted, and 39 percent in summer when crops are maturing. On the Neosho watershed, 1 large flood occurs every 7 years, 1 medium flood every 2 years, and two minor floods every year. On the upper White River, damaging floods average three a year. Combined average damages from floodwaters alone for these watersheds amount to over $16,500,000 each year; and damage caused by sterile or destructive sediments is estimated at nearly $9,800,000.

Value of Watershed Measures

Floodwater damages from great floods can be reduced relatively little by watershed measures. But more agricultural damage results from the smaller, more frequent floods on the smaller tributaries than from the larger, more spectacular but less frequent floods such as attract Nation-wide attention. Significantly, it is the smaller floods on the lesser streams that can best be alleviated by upland-watershed measures. Moderate to very severe erosion now obtains on from one-quarter to half the total area of the several watersheds investigated. Usually the worst erosion occurs on the deeper, more productive upland soils, or the soils that have the greatest potential capacity, when properly utilized, for absorbing and storing storm rainfall.

Agriculture's watershed program has been designed specifically to improve such watershed conditions, and at the same time to aid in reducing flood-plain losses and living hazards. Much of lasting value has already been accomplished. In no case, however, have programs been undertaken to the necessary extent or intensity. Still more needs to be done to coordinate these and related activities on a unified watershed basis. Watershed-wide land treatment is of vital importance.

Broadly, the programs include the development or improvement of crop, pasture, and forest practices, the retirement of poor cropland to permanent cover, stabilization of large gullies and other erosion hazards, advice to farm and nonfarm landowners on methods of protecting and managing their lands; public assistance in land treatment through the provision of machinery, materials, seeds, plants, lime, fertilizer, and labor; and road-erosion control, stream-bank stabilization, and other minor channel work.

Had watershed conservation been in effect throughout the uplands, more land would have been in permanent pasture and woodland, and the erosion-resistant quality of all types of vegetation greatly improved. These conditions would have prevented a considerable proportion of the sediment damage that actually occurred.

No Quick Solution Possible

Flood problems cannot be quickly overcome. Much reservoir construction will be necessary to help bear the burden which has proved too much for levees, floodways, and other channel improvements alone. This will take time and careful planning.

Extensive watershed measures will be essential also; but these likewise cannot be expected to accomplish their effects immediately. Certain benefits will accrue quite soon from the protection of soil and vegetation. In most cases some effects of proper land management should be evident within a very few years. These will include increased crop yields, more and better pasturage, and more productive forest growth. Erosion losses will decrease comparatively quickly. Storm run-off and flood-flow as the result of farm practices will also show up fairly quickly. In forest areas results will become apparent within a few years, but a long period may elapse before the maximum effect is obtained. In order to achieve the greatest possible benefit in the shortest possible time, it is essential that the upstream and downstream phases of flood control be properly timed and coordinated, through the development of one over-all plan for each of the major flood-contributing watersheds.

WHEAT

Almost beyond belief is the position that wheat is coming to hold. As the result of heavy feeding of this grain to livestock, and of its use in the production of alcohol, wheat is moving rapidly from a surplus to a deficit situation.

Large production and limited exports in recent years had built up heavy stocks. On July 1 last, the carry-over was 618 million bushels, only slightly smaller than the 632 million bushel carry-over on July 1, 1942. But by July 1, 1944, the carry-over stocks will be much reduced—probably down to about 300 million bushels. One year later they may be smaller. Our food consumption of wheat has increased only slightly, but for livestock-feeding purposes we may want to import considerable wheat in 1944, unless we have a very exceptional crop.

It should be borne in mind that we have ample supplies of wheat for food uses in this country. Other surplus-producing regions of this hemisphere also have large supplies. The rapid disappearance of our stocks and the requests the Government has made to farmers for an increase in their wheat acreage are consequences of an increased demand for wheat as livestock feed and as raw material for making alcohol.

Production in 1944, if we have normal growing weather, should be sufficient to take care of all requirements, including normal feeding requirements. Wheat we import will be used for livestock feeding above the normal use of wheat for that purpose. The Government has asked for increased wheat acreage only where wheat will produce more feed units per acre than feed grains, under the prevailing labor and crop-rotation conditions.

Feed-Use of Wheat

Use of wheat as feed for livestock was considerable in pre-war years. In the 10 years prior to 1942 the average use for this purpose was above 100 million bushels annually. In the 1942–43 crop year, however, livestock consumed more than 300 million bushels of wheat, and the total for 1943–44 may exceed 400 million bushels.

So large a use of wheat for livestock feeding might be frowned on in normal times; but the war situation stimulates a tremendous increase in livestock numbers and gives crops other than wheat a preference in overseas shipments. As the corn reserve declines and large reserves of wheat are available, wheat comes inevitably into increased demand for livestock feeding. It supplements limited supplies of the main feed grains and makes possible a continued flow of concentrated food to our armed forces and to our allies. The Congress authorized a feed-wheat sales program for 1943–44, which provided for sales by the Commodity Credit Corporation at the parity price of corn. There

were no specific quantity limitations—merely the amount owned by the corporation, whether acquired under the wheat-loan program or by purchase.

Wheat for Alcohol

Our pre-war use of wheat for alcohol was negligible. Even in 1941–42 it amounted only to 2 million bushels, though by that time we were producing war supplies in volume. In 1942–43, however, the total jumped to 54 million bushels; in 1943–44 it may reach 110 million bushels. How much wheat we actually use for making alcohol will depend on the extent to which through improved ocean shipping conditions we can increase our imports of molasses. Alcohol from wheat enters into the production of synthetic rubber, smokeless powder, and other war supplies. With larger and larger quantities of wheat being used for making alcohol, as well as for the feeding of livestock, wheat climbs higher in the list of war essentials. In the early months of the war its position apparently depended on the export outlook, which was not favorable. Domestic utilization is the keystone now.

Wheat Program Changed

It has consequently been necessary to alter the wheat-adjustment program. The policy up to the spring of 1943 was to curtail the acreage so as to provide for domestic needs, for probable exports, and for carry-over requirements, which included a reserve for small yields. It became evident, however, that largely increased provision would have to be made for the use of wheat in livestock feeding and alcohol production.

The War Food Administration therefore removed the wheat-acreage and wheat-marketing restrictions. In July it asked wheat growers to step up their 1944 acreage to about 68 million acres, as compared with 54.2 acres seeded for the 1943 crop. Though the 68 million acres desired for 1944 is about 26 percent above the acreage seeded in 1943, it is only about the same as the 1932–41 average, and materially below the record acreage of 81 million in 1937. The administration felt that 68 million acres was about as much as could be grown, in view of the need to maintain sound farming practices and simultaneously to expand the acreage of other urgently needed crops.

As a matter of fact, except in the North Central and Eastern States, the acreage requested is quite close to the 1937 peak. Other crops will contribute more to the war effort in the north central and eastern regions. In the Great Plains States, from Montana and North Dakota to Texas, the administration recommends very substantial expansion, with smaller increases in the Pacific Northwest. Elsewhere outside the North Central and Eastern States the acreages requested are about the same or slightly larger than in 1943. Average yields on the total acreage desired will produce enough wheat for food, for seed, for alcohol production, and for feeding livestock on the farms where the wheat is grown and in addition for moderate lend-lease shipment and war relief. It will not provide very much wheat for sale as feed.

The Hemisphere's Position

Our wheat carry-over on July 1, 1944, if reduced to about 300 million bushels, will provide for the United States commitment of 50 million bushels for post-war relief. In addition it will provide for working stocks and a reserve against small yields. But it will be well under the 400-million-bushels maximum set forth in the Memorandum of Agreement among the five nations that have signed the International Wheat Agreement; namely, Argentina, Australia, Canada, the United Kingdom, and the United States. The United States will not have an excess of wheat beyond lend-lease requirements, regular exports, and commitments under the International Wheat Agreement. But Canada has large supplies; that country's exportable surplus in the 1943–44 marketing year will amount to about 700 million bushels, or to more than the quantity likely to be required in annual post-war trade under the most favorable conditions. Moreover, Argentina and Australia have exportable surpluses of record size.

Income to United States Growers

Wheat income figures underline the change that has taken place in the wheat situation. Cash income to United States wheat growers in 1943 will run about 900 million dollars, as compared with 400 million in 1938. Both the cash farm income from wheat and the price in 1943 have been more than double the average for the 1938–40 period. In addition to cash income, growers received agricultural conservation payments of 8.5 cents and crop-parity payments for 13.7 cents per bushel on the normal yield of the farm-acreage allotment.

COTTON

Consumption of cotton in the United States reached an all-time peak of 11.2 million bales in 1942, an advance of 63 percent from the 6.9 million bales used 5 years ago. In foreign countries the havoc of war caused a decline in the use of cotton to 13.7 million bales, the lowest level since 1920 and 37 percent below the pre-war use of cotton. These divergent trends arise from the difficulty of moving cotton to the mills located in importing countries and from the expanded operation of mills in this country to supply the cotton goods for clothing, tents, balloons, nets, bags, and a multitude of other articles essential to the war effort. World consumption of all kinds of cotton has declined each year since 1938. In that year, the last before the outbreak of the war, consumption totaled about 28.5 million bales, whereas in 1942–43 it is estimated at about 25 million bales.

At the end of the current season the carry-over in the United States is estimated at 10.7 million bales, about 16 percent smaller than on August 1, 1939. In foreign countries, the carry-over is probably close to 13.3 million bales, or about 54 percent higher than 4 years earlier. Thus the carry-over in the entire world is considerably higher than ever before, although the stocks of American cotton are somewhat smaller than at the beginning of the war.

Despite the comparatively large carry-over, there is a scarcity of some qualities of cotton. Domestic supplies are unbalanced, with a surplus of low grades, especially in the shortest staples, and a scarcity of high grades, particularly in the medium staples. Considerable substitution of lower grades for higher has taken place, but this requires more cleaning equipment and more labor, slows up yarn and cloth production, and results in lower quality textiles.

In an effort to relieve this situation the production of longer staple and better quality cotton has been part of the national farm program. The 1942 goal for cotton placed special emphasis on the production of 1⅛ inch and longer staple cotton and the harvesting of cotton in such a way as to obtain the maximum amount of the higher grades. The staple situation improved in 1942.

The 1943 goal further emphasized the need for an adjustment in the supply of very short staple cotton. Fortunately farmers in many areas found it advantageous to shift to peanuts, and others found it profitable to grow feed crops, while many growers changed to longer staple varieties of cotton. These changes added considerably to the supplies of essential oilseeds and to livestock production so as to make for a larger supply of food. The 1943 cotton crop, together with the expanded production of other crops in the Cotton Belt, will constitute a vast supply of farm products of primary importance in the war effort.

Cotton Prices

The farm price of cotton held close to parity during the 1942–43 season. From May through August 1942 the parity price of cotton held constant at 18.85 cents. Since that time each successive month saw an advance in parity, which reached 20.46 cents per pound in July 1943, reflecting the rise in the index of prices paid by farmers, including interest and taxes. Price changes during the year resulted in grade and staple premiums and discounts which offer a much greater inducement to farmers to pick, handle, and gin their cotton in such a manner as to obtain as high a grade as weather conditions permit.

Cotton Textile Problems

Developments during the past year call attention to problems affecting the cotton industry. Since April 1942 the daily rate of cotton consumption in this country has fallen from 46,142 bales per working day to less than 41,000 bales.

While the capacity of textile machinery was an initial factor in fixing the ceiling on cotton consumption, the labor shortage and the substitution of lower grades of cotton are current factors operating to cut down the use of cotton. In foreign countries mills have been unable to obtain cotton in desired amounts and have been forced to strive for self-sufficiency through expanded synthetic fiber production, particularly production of rayon staple fiber. Technological developments have enabled synthetic fibers to compete with the natural vegetable and animal fibers in a far wider range of uses than formerly. It may be too early to visualize in detail the full impact of synthetic fibers on cotton consumption in the first post-war years; yet it is certain that American cotton will face keen competition from synthetic fibers at home, and from both synthetics and foreign cotton in other countries.

LIVESTOCK AND FEED

Livestock production, which was at a record level in 1942, will reach greater heights in 1943. The pig crop will total over 120 million head. The average weight of hogs marketed has reached an all-time high. The number of cattle and calves on farms continues to increase. By January 1, 1944, cattle numbers are expected to be 5 to 10 percent greater than at the previous peak in the cattle-numbers cycle in 1934. The number of sheep and lambs on farms declined moderately in 1942 and apparently will show a further decline in 1943; but slaughter has been large. Poultry production also will reach record levels in 1943.

The pig crop has exceeded all expectations. The Department's goal for a 15-percent increase apparently will be surpassed. An increase of 10 pounds in average market weight of hogs was requested; slaughter records reveal a gain of over 20 pounds in market weight. Cattlemen were advised to increase slaughter to take advantage of high prices and to prevent further accumulation of beef cattle on farms. But with favorable prices, beef cattle numbers next January 1 are likely to show a substantial increase over the previous year.

Because of heavy culling of ewes last fall, sheep numbers on farms January 1 were 3 percent smaller this year than last and the lamb crop was smaller. Further heavy culling of ewes is taking place this year. Lamb and mutton, however, constitute only a small portion of our meat supply. Our production of wool in 1943 is slightly smaller than the 1942 record production, but almost all of the surplus production of the Southern Hemisphere is available to the United Nations.

Supplies and Requirements

As a result of improvement in shipping facilities, particularly from Australia, the wool-supply situation has improved, and civilian consumption quotas have been increased considerably over a year ago. Mill consumption of wool in the United States last year was the highest on record—11 percent above a year earlier and more than twice as large as the domestic production. It continued high in 1943. The Commodity Credit Corporation began in April to take over the unsold portion of the domestic wool clip, and the Government's program assures relatively high prices to growers for the 1943 wool clip. The wool is being handled for the Government through regular trade channels.

Production of meat has reached new heights. Production in 1943 is expected to be about 24 billion pounds dressed weight, as compared with 21.5 billion pounds in 1942 and 16.2 billion pounds, the average for 1935–39.

About 27 percent of the 1943 production will be required for the military, lend-lease, Red Cross, and contingency reserves, as compared with only 19 percent last year; so that civilian supplies per capita will be about 8 percent less than in 1942, but about equal to the 1935–39 average.

The high level of consumer income has necessitated much direct governmental action, notably formal rationing of meats, which was started in late March. The rationing, carried out on a point basis with point values changed as changes occur in supply and demand, allows different point values for the several cuts.

The Feed-Livestock Relationship

Mainly because of the tremendous gain in hog and cattle numbers during 1943, farmers in 1944 will be faced with the necessity of reducing livestock output. A decline of perhaps 3 percent in total livestock production, including output of dairy and poultry products, is in prospect for the coming year. This will be accompanied, however, by an increase in slaughter, so that meat output in 1944 will be greater than in 1943.

As a guide to farmers in planning their production program for 1944, the War Food Administration announced in September 1943 that the price of good to choice butcher 190– to 230–pound hogs would be supported at $12.50 per hundredweight, Chicago basis, for the period October 1, 1944, to March 31, 1945. This compares with the support price in effect until September 30, 1944, of $13.75 per hundredweight, Chicago basis, for heavy hogs.

The 1942–43 feed supply permitted a record rate of feeding per grain-consuming animal unit and left a grain carry-over well above the long-time average. But an unprecedented demand for feed resulted in a general rise in prices of those feeds not regulated by price ceilings. It resulted also in shortages of many byproduct feeds at the ceiling prices, particularly oil cake and meal. Commercial supplies of corn declined more than seasonally following the establishment of a price ceiling on corn in January 1943, and a shortage of corn at commercial markets became pronounced. Corn processors found it difficult to obtain adequate supplies.

The supply of feed grains for 1943–44, including wheat and rye for feed, may be 5 to 10 percent smaller than it was in 1942–43. With increased livestock numbers, the feed-grain supply per animal unit may be about 15 percent smaller than in 1942–43; in fact below the average for the past 5 years. Nearly all the 1943 supply may be consumed during the coming marketing year. Perhaps only a minimum carry-over will remain in 1944. Supplies will continue to be supplemented, however, by imports of oats, barley, and feed wheat from Canada, and by the release of Government-owned wheat for feed.

Feed-crop acreage may be increased in 1944. But the possibilities of further gains in feed output are limited by the immediate war need of producing more grain, oil, and vegetable crops for direct human consumption. The acreage of wheat, soybeans, and peanuts will be expanded. Output of certain vegetable crops also will be increased. Virtually all tillable land will be utilized in 1944. Further marked in-

creases in livestock, therefore, would have to come at the expense of food crops, which are generally recognized as more efficient convertors of soil nutrients into human nutrients than grain-consuming livestock.

During 1943–44 the supply of protein feeds will be slightly larger than in 1942–43. It will be smaller, however, per grain-consuming animal unit. Hay production is above average in most sections of the country and the total hay supply is estimated to be 112 million tons, only 4 million tons below the record supply of last year. Pasture conditions during the past summer have been the second best since 1927.

Meat Price Ceilings and Rationing

To check meat prices, the OPA set price ceilings in early 1942 at March levels. These prices varied between areas and between stores in a given area. Cases of oversupply and undersupply developed, because meat tended to flow mostly to the stores having relatively high prices. Subsequently, to simplify its program, the OPA set up specific dollar-and-cents ceilings for each area.

To obtain sufficient meat for Army, Navy, lend-lease, and other uses, the War Food Administration restricted deliveries for civilian consumption. During the third quarter of 1943, for example, it limited deliveries of packers to 65 percent of their 1941 base on beef and veal, 80 percent on lamb and mutton, and 85 percent on pork. With increasing livestock marketings, however, delivery limitations were suspended in September.

The price and ration program of the OPA and the programs of the War Food Administration had to be adjusted to abnormal and extreme shifts that occurred in the marketing of meat animals. Hog marketings and to a certain extent cattle marketings under Federal inspection were relatively light in the first part of the year, normally a period of heavy marketings. On the other hand, local butchering was unusually heavy during this period, partly reflecting black-market operations.

FRUITS AND VEGETABLES

Short supplies of many fruits and vegetables, along with a greatly increased demand, characterized the 1943 season. Prices for fruits and vegetables advanced generally to levels well above those of the preceding year.

Cash income to growers was much larger in 1943 than in 1942—about 40 to 45 percent larger from fruits, despite an aggregate production considerably smaller, and about 45 percent larger from vegetables, including potatoes and sweetpotatoes. As a partial offset, growers had to pay higher costs for labor, equipment, and supplies. Moreover, in some areas they incurred abnormal losses from adverse weather conditions, and also from inability to get sufficient labor. In certain areas transportation was temporarily a problem, though transportation in general was adequate for the fruit and vegetable industry.

Markedly smaller deciduous fruit production was partially offset by large citrus crops. Apple, apricot, cherry, peach, and pear crops were far below the average, especially in the Eastern States. Citrus production was above the average and also grape production.

Price ceilings at the fresh-fruit level were placed on oranges, grapefruit, lemons, certain berries, cherries, and apples. Retail prices on the 1943 pack of canned peaches and pears remained at about the 1942–43 level, but on other canned fruits it became necessary to adjust the ceilings upward somewhat. The small production of many fruits, combined with strong consumer demand for fresh consumption and the consequent sharp, unregulated price advances for some fruits in fresh market outlet, obliged the Government to channel certain fruits into desired uses. For example, in specified counties of California it prohibited the use of raisin-variety grapes for purposes other than drying and placed restrictions on the interstate movement of certain fruits.

Civilian supplies of fruits, both processed and fresh, will be far smaller in the 1943–44 season than they were in 1942–43. In canned fruits and fruit juices the civilian supplies may be only about three-fourths to four-fifths those of last season, whereas the supply of fresh fruit will be about 12 to 15 percent less. Tin allocation orders have limited the canning of some fruits.

The civilian demand for fruits, processed and fresh, continues far in excess of the supply. Consequently it has been necessary to continue the rationing of processed fruits, the noncivilian requirement for which is large. Of the 1943 season's canned fruit and fruit-juice packs, the reservation for Government purchase amounts to the equivalent of about one-third of the 1942 packs. It probably will take almost two-fifths of the 1943 packs. The entire dried-fruit pack, with the exception of figs and dates, has been reserved for the Government,

though part of it will be released to civilians after the Government's needs have been ascertained.

Vegetable Production and Price Rulings

Commercial vegetable production for fresh use in 1943 was materially smaller than in 1942—in the aggregate about 11 percent below the record production of last season. Production of carrots and snap beans was larger than in the previous year, but the production of several vegetables, notably onions and cabbage, did not equal the levels requested in the goals.

Killing frosts and generally cool weather interrupted the early growing season, and floods in some areas curtailed the vegetable acreage. In general, growers observed the Government's request to reduce the acreage of important tonnage crops, such as watermelons, cantaloups, and cucumbers. Production in Victory Gardens was a partial offset to the reduction in commercial supplies.

In vegetables for processing the season opened with growers reporting intentions to plant considerably increased acreages. The actual planted acreage, however, was only about 1 percent larger than in 1942, probably as a result of unfavorable planting conditions in many areas. Tomato, corn, and green pea production was smaller than in 1942, and snap bean production greater. No tin restrictions were in effect on the major canning vegetables, but tin-conservation orders limited some of the minor packs.

Without establishing specific goals for canning crops, WFA asked canners to contract acreage to the limit of their facilities, and reserved about one-third of the pack for Government purchase. The lower production and the reservation order indicated that civilian supplies for the 1943–44 season would be about three-fourths to four-fifths those of the previous season.

Prices for fresh vegetables rose sharply at the beginning of the year. The advance slowed down toward the end of February, when the Office of Price Administration placed seven major vegetables under ceiling prices. In July OPA placed permanent ceilings on lettuce and cabbage. On October 14th the OPA and WFA announced ceiling prices for 13 fresh vegetables including lettuce and cabbage.

Price support for fresh vegetables was largely an indirect result of the price supports in effect for processing vegetables. The WFA also made special payments on a number of vegetables, including snap beans, lima beans, carrots, beets, tomatoes, cabbage, onions, and green peas. Growers received $50 per acre for each acre which they planted in excess of 90 percent and up to 110 percent of their individual goals. Though their market was excellent, the growers had to cope with other problems such as the limitation placed on the use of nitrogen fertilizers and the acute labor shortages in some areas.

All processed vegetables remained subject to ceiling prices. Meanwhile, the price-support program was expanded to include tomatoes, sweet corn, snap beans, lima beans, green peas, beets, carrots, and cabbage for kraut, and this program assured grower prices 20 to 50 percent higher than those of 1942. Ceiling prices for tomatoes, peas, snap

beans, and corn remained approximately at 1942 levels, because of the Commodity Credit Corporation purchase-and-resale program to ease the pressure on processors and distributors. On some other processed vegetables OPA revised the ceilings upward to some extent.

Potatoes and Sweetpotatoes

As a means of encouraging increased production of potatoes, WFA announced that it would support potato prices at approximately 92 percent of parity. In addition it offered growers a payment of 50 cents a bushel on the normal yield of all acreage planted in excess of 90 percent and up to 110 of their individual potato acreage goals. Other Government agencies helped growers to get fertilizer, machinery, and other materials. As a result, it is expected total civilian supplies of potatoes in 1943–44 will be about 15 percent larger than in 1942–43. About 22 million bushels of the 1943 crop is expected to be dehydrated for noncivilian requirements and an additional 50 to 55 million bushels required for other noncivilian uses. As production responded to the efforts of growers and to the Federal programs, the potato shortage of April, May, and early June disappeared and with it most of the black market to which the shortage had given rise.

The crop of sweetpotatoes in 1943 was one of the largest on record, and exceeded the 1942 crop by approximately one-sixth. This large production followed announcement by WFA in March of a price-support program for sweetpotatoes. In the first half of 1943 sweetpotato prices rose to extremely high levels.

As the new crop came on the market, however, prices declined but remained above support levels. The output was sufficient not only to provide amply for all military and lend-lease requirements, which included about 3.2 million bushels for dehydration, but to provide civilians with a supply from 5 to 10 percent larger than that of 1942.

Dry Beans and Peas

In recent years the production of dry beans and peas has expanded hugely. This year the dry bean crop was about one-sixth larger than the record crop of 1942; the dry pea crop exceeded last year's by no less than one-third. Much of the increase has come from the Pacific Northwest and the western Mountain States. Civilian supplies will be somewhat larger in 1943–44 than they were last season, despite increased Government purchases for military and lend-lease use.

The dry bean crop is subject to both ceiling and support prices. Last year's crop, much of which was marketed this calendar year, sold during most of the marketing season at ceiling or near-ceiling levels. In 1943, WFA announced increased support prices for the 1943 crop and instituted a program to sustain the increase without breaking the ceiling, which had already been adjusted upward in line with parity and certain variety differentials. A price-support program is in effect also on dry peas.

TOBACCO

The wartime importance of tobacco has increased during the past year. Although it is not a food crop and is regarded by some as purely a luxury product, sharp increases in its consumption in this country and in other warring countries where it still can be obtained indicate that it is an important factor in morale. Furthermore, the loss of overseas supplies of imported insecticides has brought about an increased dependence in the United States upon tobacco byproducts.

In the calendar year 1942 tax paid withdrawals and production of all tobacco products except smoking tobacco showed a sharp increase over 1941. The withdrawals of cigarettes rose from 208 to 236 billion; cigars from 6.1 to 6.3 billion, and the production of chewing tobacco and snuff increased by 9.4 and 3.5 percent, respectively. The rise in consumption of tobacco products is continuing during the present calendar year. Actually, the production of tobacco products and the quantities of leaf tobacco used in the United States increased more than some of the above figures indicate. Tax paid withdrawals do not include the tremendous quantities of tobacco products shipped to or earmarked for shipment to members of the armed forces outside of the continental United States.

It is estimated that in 1942 the unstemmed equivalent of leaf used in the manufacture of cigarettes amounted to 740 million pounds, and leaf used in all tobacco products to 1,180 million. These increases of 18 and 16 percent, respectively, over 1941, carried the quantity of tobacco used in cigarettes and in tobacco products as a whole to the highest levels on record. It is probable that members of the armed forces both in this country and abroad consume more tobacco than they formerly used in civilian life. War has also increased the demand of civilians for tobacco products. This is partly due to the record high levels of industrial activity and consumer income.

In recent years there has been a fairly close relationship between industrial production and incomes on a per capita basis and the per capita consumption of tobacco products. Other factors probably are longer hours of work, nervous strains and generally higher speed of living conditions. This present sharp rise in the utilization of tobacco has important long-time implications. A rise in tobacco consumption tends to be carried forward into the future because of the habit-forming nature of the use of tobacco.

Overseas Shipments of Tobacco

The past year has seen a continuation of the shipment of large amounts of American tobacco to allied and neutral countries. The war has increased the demand for tobacco products in foreign countries as well as in the United States, and the movement of United States leaf abroad would have been even greater had it not been for

the shortage of shipping, the blockade of enemy and enemy occupied territory, financial obstacles, etc. Nearly all of our exports during the past 2 years have been flue-cured leaf and a large proportion has gone to our allies, particularly the United Kingdom under lend-lease arrangements.

Since April 1941, when the first shipments of tobacco were made under lend-lease, approximately 427 million pounds of American flue-cured have been sent abroad under this arrangement, about 87 percent of it to the United Kingdom. These shipments have served two important purposes. In the first place they have supplied a large part of the minimum tobacco requirements of a great fighting ally. In the second place, by maintaining the proportion of United States leaf in English cigarettes, they have assured a large post-war market for American tobacco in the United Kingdom. Prospects for United States tobacco have been further improved by reduction in the margin of tariff preference accorded Empire-grown leaf.

Byproducts-Diversion Program

In the course of the war, particularly following Pearl Harbor, the United States has been increasingly cut off from overseas supplies of raw materials from which important insecticides and fungicides are made. The same has been true of allied countries. Consequently the United States has had to expand its production of nicotine sulfate and other tobacco byproducts in order to meet the needs of food producers in this and allied countries. Since the quantities of nicotine sulfate which would normally be made from stems and scraps and from low grades of dark tobaccos would have fallen far short of requirements, it has been necessary for the Government to take steps to increase the output of byproducts.

Ready at hand was a byproduct diversion program which had been used in earlier years to reduce burdensome stocks and to support prices of dark tobaccos. This program was quickly converted to a war basis and, combined with an allocation order applying to certain of last year's dark tobaccos, has made possible a material increase in the output of nicotine sulfate. Nicotine sulfate is subject to price ceilings, and in order to make possible its production on a large scale under these ceilings the Government has reimbursed byproduct manufacturers to the extent of the difference between what they have actually had to pay for tobacco in the market and what they could afford to pay for it under the price ceilings established for their products.

Tobacco Prices and Incomes

The crops of flue-cured and burley tobaccos and certain cigar types grown in 1942 as well as prices of tobacco products have been subject to price ceilings. This has been necessary in order to prevent a disastrous inflation in prices which would have adversely affected the whole price-stabilization program and in the long run would have been injurious to the best interest of the growers themselves. However, such ceilings have been high enough to permit the booming demand for tobacco to reflect substantially higher prices and incomes to growers.

DAIRYING

Total milk production on farms during the first 8 months of 1943 was practically the same as the record high production obtained in the corresponding period of 1942. Milk cow numbers were 2 to 3 percent larger than a year earlier. Production per cow, though down from the record high 1942 level by a corresponding amount, was 5 percent larger than the 1935–39 average output. Pasture conditions continued unusually good during the summer, and dairymen fed large quantities of concentrates to their animals.

By November milk production declined somewhat. Feed prices advanced, milk-feed price ratios became less favorable, and the output was 2 percent lower in October than in October 1942.

So that dairy farmers would be enabled to meet rising feed and other costs, the War Food Administration announced a program of payments for milk or butterfat marketed during October, November, and December. The rates vary from 30 to 50 cents per hundredweight of milk, and from 4 to 6 cents per pound of butterfat. In each of the several regions into which the country is divided, the rate of the payment is the same to all producers, but the rates between regions vary according to price changes that have occurred since September 1942 and according to the proportion of dairy feeds purchased normally.

Consumption of fluid milk and cream in the second quarter of 1943 was about 5 percent above that of the preceding quarter and 10 percent above that of the second quarter of 1942. As already mentioned, milk production was about the same. Production of most manufactured dairy products was consequently smaller than in the corresponding months of 1942.

Dealer Quotas Established

In an effort to maintain the production of manufactured dairy products (principally evaporated milk, butter, cheese, and dry milk) at levels sufficient to supply essential wartime civilian needs, WFA in August authorized its Director of Food Distribution to regulate expanding fluid-milk sales through a system of dealer quotas. Milk sales areas were established and quotas assigned to distributors.

The quotas represented the maximum permitted sales or deliveries of fluid milk, cream, and fluid-milk products. Established under Food Distribution Order No. 79, this conservation program went into effect first in the areas of heavy urban population where milk supply problems are most critical: it is being extended to other areas as administrative facilities permit.

The details vary with local needs.

In the first markets brought under the program, dealers' quotas were set at 100 percent of the quantity of fluid milk they sold in

June. Quotas for sales of cream and fluid milk byproducts (skim milk, buttermilk, flavored milk drinks, and cottage cheese) were set at 75 percent of the quantities sold in June. These quotas permit consumers to purchase more milk than they consumed in 1942 and considerably more than in pre-war years.

If this type of regulation does not succeed, consumer rationing of fluid milk and fluid-milk products may be necessary in many areas. Rationing of such highly perishable products would be extremely complex at the consumer level.

Programs for Dairy-Product Increase

The Department had previously developed other programs for increasing the output of dairy products. They applied mainly to American cheese, evaporated milk, and dried skim milk, all of which are needed in large quantities by our military forces and our allies.

The measures that have been taken include: A plant-expansion program to increase the production of dried milk; reservation orders requiring manufacturers to set aside specified portions of their output of dried milk, butter, and cheese for sale to Government agencies; limitations on the production and sale of fluid cream and ice cream; recommendations to the Office of Price Administration for the rationing of butter, cheese, and evaporated milk; support prices for all dairy products; and extra payments on cheese and on milk for fluid use in selected areas.

Insofar as farmers can shift from separating their milk on the farm for sale of cream to selling whole milk at wholesale, production of cheese, evaporated milk, and dried skim milk can be maintained, even though fluid-milk sales are increasing. However, the lack of plants in areas in which such a shift could be brought about and the value of skim milk as a high-protein feed for hogs and poultry make it difficult to bring about much of a shift.

The plant-expansion program for dried skim milk has been under way since March 1941. Under this program 25 spray drier units have been completed and 27 additional units have been approved and are in various stages of completion. About 60 rollers have been approved for installation, of which about half were in operation by mid-1943. The increased output from these plants, however, has been less than the decrease in production by plants located in fluid-milk areas. New plants are being approved and built as fast as possible.

Dairy Supplies for Civilians

Supplies of dairy products available to civilians during the fiscal year 1942–43 were almost as large as in the preceding fiscal year; it appeared, however, that consumers, with their generally increased incomes, would have liked to purchase 10 to 15 percent more dairy products than were available for them. It was consequently necessary so as to hold civilian consumption at a reasonable level and assure adequate supplies for war uses, for the Department to put various reservation and limitation orders into effect.

In November 1942 the Department required manufacturers of spray-process dried skim milk to set aside 90 percent of their monthly production for Government use. This product, which can be reconstituted to make liquid milk, was badly needed for military and lend-lease use. Roller-process dried skim milk could be used equally well by most domestic industries. About the same time the War Production Board, at the Department's suggestion, prohibited the sale of cream containing in excess of 19 percent butterfat, except for the manufacture of other foodstuffs.

Soon afterward orders by the War Production Board limited the production of ice cream for civilian use. In January 1942 this Department issued an order which limited the total milk solids for use in frozen dairy foods (including ice cream and sherbets) for civilian consumption to 65 percent of the amount used in the corresponding month of the base period 1941–42. These limitation orders conserved milk solids for use in more essential dairy products.

Allocations and Rationing

To obtain adequate supplies of butter for military and lend-lease needs, the Department in January required manufacturers of creamery butter to set aside 30 percent of their production for Government use. In the heavy production months of May, June, and July it required manufacturers to set aside 50 percent of their output. Under a similar order for American cheese it required manufacturers to set aside 50 percent of their production from February 15 through April and 70 percent in May, June, and July. An amended order required manufacturers of both roller- and spray-process dried skim milk to set aside 75 percent of their production during June and July for Government use.

At the suggestion of the Department, OPA established rationing for butter and cheese in late March to assure consumers their fair share of the limited supplies. In June, on the recommendation of this Department, OPA instituted rationing of evaporated milk to conserve limited supplies for infant feeding and for persons unable to obtain fresh milk. Also, OPA extended cheese rationing to all types except cottage, pot, and bakers' containing 5 percent or less of butterfat, likewise on the recommendation of this Department.

Price Supports

Support prices at 90 percent of parity, but not less than the OPA price ceilings through June 30, 1944, were announced in November for all of the major dairy products. Price ceilings for cheese were low relative to those for other dairy products. Accordingly, the Commodity Credit Corporation offered to purchase cheese of usual moisture content from factories at 27 cents per pound and sell it back at 23.25 cents, the maximum allowed under the price ceilings.

To participate in this purchase-and-resale program, cheese factories were required to pass the full amount of the increased price back to farmers. Similar programs were carried out in several fluid-milk

markets during part of the year for the purpose of increasing returns to farmers without raising retail price ceilings.

Other programs developed in the Department or in cooperation with other Federal agencies to help dairy farmers in their production included the maintenance of price ceilings on dairy feeds and the securing of adequate farm machinery and dairy processing equipment. Especially useful was the release of feed wheat by the Commodity Credit Corporation.

Purchases by Government

The Department purchased substantial quantities of dairy products for use in meeting military and lend-lease requirements. From July 1942 through June 1943 such purchases totaled 100 million pounds for cheese, 4 million cases for condensed and evaporated milk, 40 million pounds for butter, 211 million pounds for dried skim milk, and 29 million pounds for dried whole milk. These purchases constituted 10 percent of total production for cheese, 5 percent for canned milk, 2 percent for butter, and 37 percent for dried milk. The total cost to the Government in the fiscal year 1942–43 was $110,000,000. In addition the military forces purchased substantial quantities of dairy products direct.

Heavy buying of dairy products by Government agencies, along with an improvement in civilian demand, gave dairy farmers by far the highest incomes on record. Cash farm income from dairy products in 1942 totaled $2,287,000,000—21 percent more than in 1941 and by far the largest such income on record. Total milk production on farms in 1942 was 3 percent larger than in 1941. Average prices received by farmers for milk and butterfat were up 17 percent. Due largely to higher prices, farm income from dairy products in 1943 may increase by at least as much as in 1942.

SUGAR

The quantity of sugar made available to American consumers during 1943 was substantially larger than in 1942. The increase was made possible by increased arrivals of sugar from offshore areas, particularly the Caribbean, following the apparent defeat of the Axis submarine campaign of 1942 and the early months of 1943. While the household sugar ration remained virtually stationary, considerably more sugar was released in 1943 for home canning and for industries which used sugar as an ingredient in the manufacture of their products. It was possible in August to increase sugar allotments to all industrial users from 70 percent of 1941 usage, the level which had prevailed since the beginning of the year, to 80 per cent.

Since takings of sugar by consumers in the base year of 1941 were the greatest on record, it is believed that the current industrial ration, plus the sugar made available for the manufacture of food products for the armed forces and lend-lease, is sufficient to enable many food manufacturers to operate at about normal capacity. Moreover, in order to encourage the production of necessary food commodities, supplemental allotments of sugar were granted for the manufacture of low-sugar-content bakery products and breakfast cereals, and fruit preserves, as well as for drugs and medicines.

One difficult problem is whether any future increases or decreases in industrial sugar allotments should be applied uniformly to all manufacturers, regardless of the nutritive value of their product, or whether certain industrial users, such as bread and jam manufacturers, should receive further preferential treatment.

Continental Sugar-Beet Problem

Increased sugar receipts from insular areas were greatly needed to overcome the serious decline in continental beet-sugar production during 1943. This decline took place despite a price-assistance program which guaranteed sugar-beet growers an increase of $1.50 per ton of average quality sugar beets over the price received by them under their 1942 contracts with processors, and which guaranteed minimum returns to processors. This program brings the returns of growers up to an average of $11 per ton, which is the highest price in more than 20 years.

Although numerous reasons have been given for the curtailed sugar beet output, the fundamental reason, as in World War I, appears to have been that farmers preferred to grow competitive crops which were more attractive financially and which required less labor than did sugar beets. However, an important deterrent to beet sugar production in the last war was the scarcity of sugar-beet seed, for which we were dependent on Europe. During the intervening years, this country became self-sufficient in the matter of seed.

Cane Sugar—Continental and Offshore

Sugar production in 1943 in the mainland cane area, which comprises Louisiana and Florida, registered an increase over 1942. During August of 1943 a price assistance program was announced for Louisiana sugarcane growers, under which they were assured an increased return of about 33 cents per ton of sugarcane above the prices for the previous crop. This increase was primarily intended to assist growers to obtain the workers needed to harvest their cane crop, one of the largest in the history of Louisiana.

The intensive submarine campaign in 1942, coupled with the shipping shortage, prevented the transfer to continental United States of a very large portion of the 1942 Cuban sugar crop, almost all of which had been bought by this Government, and forced virtual cessation of the movement of high-test molasses for idustrial alcohol.

When the purchase of the 1943 Cuban sugar crop was being discussed by representatives of the two nations in the early part of the year, there was little evidence that the transportation situation between Cuba and this country would improve during the year. Cuban sugar stocks on January 1, 1943, amounted to about 1,700,000 tons, compared with about 177,000 tons a year earlier and with an average of approximately 750,000 tons at the beginning of the five years 1937 to 1941. Consequently, a substantially smaller quantity of sugar was purchased from Cuba in 1943 than in the preceding year.

However, because the movement of sugar from Cuba to the United States during the first eight months of 1943 greatly exceeded expectations, this Government was able to buy a 1944 Cuban sugar crop at least 1,000,000 tons larger than in the prior year. The basic price paid for all three of the crops thus far bought from Cuba has been $2.65 per hundred pounds, raw value, f.o.b. Habana. This price, plus the United States import duty of $0.75 per hundredweight, plus a freight rate of $0.34 per hundredweight, results in a price comparable to the domestic duty-free ceiling price of $3.74 per hundredweight. However, the purchase contracts made special provision for absorption by the United States of certain exceptional wartime costs.

Sugar prices during the present war have been held at levels substantially lower than during the last war, and this situation has been due in part to the rapid anti-inflationary action by the Federal Government prior to our entry into the war, which has been described in earlier reports, and in part to various production and transportation (inland and ocean) subsidies.

Problems of Domestic Insular Areas

The war aggravated the food problem of the domestic insular areas from which we receive sugar, viz., Hawaii, Puerto Rico, and the Virgin Islands. It has been possible, however, under the provisions of the Sugar Act of 1937, to encourage increased food production in these Islands, and in that way to lessen the dependence of these areas on foodstuffs from the mainland. This step has been possible under the farming practice requirement, which is one of the conditions for payment under the legislation. For example, Puerto Rican growers

who wish to receive such payments were required in 1943 to plant an acreage equal to 20 percent of their land on which sugarcane was growing on January 31 of that year to soil-conserving food crops.

During the purchase negotiations for the 1943 Cuban sugar crop, the representatives of the neighbor republic were urged to promote greater crop diversification in the Island, not alone in order to make Cuba more self-sufficient in the matter of food production, but also to bring about there the production of certain agricultural commodities, such as oil-bearing crops, which are greatly needed in the United States at the present time. Since the price paid by the United States for the 1943 and 1944 Cuban sugar crops was the same as in 1942, this Government guaranteed to the neighbor republic unchanged prices for the large supplies of lard, rice, and flour which she purchases in this country.

Various Problems Solved

It will be noted that various serious problems in sugar created by the war have been solved. However, the hostilities are constantly raising new problems which complicate the sugar supply situation. After a great deal of effort had been devoted to meet the problem of interruption in ocean shipping of sugar from Cuba to eastern refining ports, new difficulties developed recently in the form of an embargo on the movement of raw sugar from the various Florida ports to which Caribbean sugar had been brought, in order to shorten as much as possible the water run to the United States. Then the inability of manufacturers of corn sugar and corn sirup to secure the corn needed for the manufacture of these products resulted in a serious shortage of these sweeteners during the summer of 1943 and it was necessary to relieve this shortage by tapping supplies of cane and beet sugar.

A recent development, which lessens the possibility of increased sugar rations to consumers, is the need for diverting large quantities of Cuban sugarcane of the 1944 crop from sugar to invert molasses for the industrial alcohol program in the United States. This step follows the placing of restrictions on the quantity of grains which can be used for the manufacture of alcohol in order to conserve grains for livestock feeding and other purposes.

POULTRY AND EGGS

Production of chickens and eggs increased considerably, while turkey production held about steady. Price ceilings and support prices were in effect for all three of these items. Prices received by farmers were well above the support levels.

The poultry industry came under general price control in October 1942. Prices of poultry and eggs, along with many other prices, were then frozen at the highest levels reached for each seller during the 5-day period, September 28–October 2, 1942. Subsequently, cents-per-unit ceilings replaced the temporary freeze levels.

Prices obtainable by farmers under the ceilings were well above the support prices for the period through June 30, 1944. Support levels announced in November 1942 were 90 percent of the parity price for chickens and turkeys, 30 cents per dozen for eggs in the spring and early summer, and an annual average egg price of 34 cents per dozen.

Marketings of chickens, which had been heavy under the temporary ceilings, declined seasonably shortly after the cents-per-pound ceilings were announced. Consumer demand continued to strengthen. In the first half of 1943 the demand considerably exceeded the supply, though the seasonal supply was the largest on record. Prices in black markets advanced considerably above ceiling levels. In the second half of the year, however, marketings of chickens began to increase and to relieve the pressure on price ceilings. By early August prices at wholesale for several classes of poultry were slightly below the ceiling levels. But the demand for turkey in 1942–43 far outstripped the supply, even during the peak marketing season.

Production of Eggs

Marketing of eggs, in contrast to poultry marketings, were declining seasonally when price control began. Localities that happened to have relatively low prices in the "freeze" period (September 28–October 2, 1942) ran very short. Supplies increased in early January. Egg prices dropped below the ceiling levels and continued below them during much of the first half of 1943. In the second half, marketing of eggs declined from peak spring levels, and the demand again exceeded the supplies.

Egg prices, though restrained by the ceilings, were favorable for farmers relative to feed costs in late 1942, and farmers culled their flocks very lightly. The number of layers on farms January 1, 1943, was 14 percent larger than a year earlier. In the spring of 1943 the egg-feed price ratio was the most favorable on record, and farmers took especially good care of their laying stock. In consequence, egg production per bird in the United States in the first half of 1943

equaled the record production of a year earlier, despite difficulties in obtaining feed in some sections and a slight lowering in the quality of feeds.

Total production of eggs for 1943 may be about 5 billion dozens, well above the goal (4,780 million dozen) and 13 percent over the record output of 1942. This production, if realized, will meet lend-lease and military requirements and give consumers in this country an average of more than 345 eggs per person. The previous record high was 342 in 1927.

Chickens and Turkeys

Farmers increased their production of chickens as well as of eggs. Demand for chicks exceeded the supply considerably. The supply of hatching eggs was a limiting factor. Chickens raised on farms in 1943 totaled 926 million head, according to the preliminary estimate—16 percent more than in 1942 and 36 percent more than the 1932–41 average. Nonfarm production of chickens, at approximately 10 percent of the farm output, increased fully as much as the farm production. Total slaughter of chickens in the United States in 1943 will closely approach the suggested goal of 4 billion pounds, dressed weight. Such an output will provide civilians with an average of approximately 28 pounds of chicken as compared with 21.9 pounds in 1942 and the 1935–39 average of 18.0 pounds.

Turkey production, limited by supplies of turkey eggs, was about the same as in 1942. Larger purchasing of turkey for the military made the supply for civilians slightly smaller. The goal was 560 million pounds, dressed weight; but midyear prospects indicated output for the year would not exceed the 497 million pounds slaughtered in 1942. Consumption per capita of chicken and turkey in 1943 may be in excess of 20 percent of the consumption of all meats (including poultry) as compared with 16 percent in 1942 and 14 percent in 1935–39.

The increase in the number of chickens raised pointed toward a further increase in the number of layers. But the tight feed situation was a limiting influence. In deciding how many layers to keep, farmers had also to bear in mind their laying-house facilities. The outlook for egg production in 1944 is for an output at least as large as that of 1943. Some curtailment seemed probable in chicken production—both farm-raised chickens and broilers.

Poultry Controls Not Extensive

Unlike other major livestock industries, the poultry and egg industry has not been subjected to extensive supply controls, which would involve numerous difficulties. Some controls would be useful. Though produced to some extent in practically every locality, supplies of poultry and eggs are distributed very unevenly when demand exceeds supplies at ceiling prices.

Some regulations have been instituted primarily to facilitate dried-egg procurement. Two orders have been issued: One of them restricted the quantity of shell eggs that could be stored for civilian

uses, and the other limited the quantities of liquid, dried, and frozen eggs that could be produced for civilian uses. Yet with consumer demand increasing constantly the job of getting dried eggs for lend-lease and the armed forces has become difficult. By midyear it had become apparent that only about two-thirds of the desired 400 million pounds would be produced. It should be noted, however, that during the first half of 1943 ample quantities were available to fill the allotted shipping space to lend-lease recipients.

FATS AND OILS

With the entrance of the United States into the war in December 1941, and the subsequent loss of most of our imports from the Far East, our fats situation changed from comparative abundance to critical shortage. The Department consequently encouraged the production of domestic oil crops, with the result that in the 1942 crop year the total output of fats and oils was about 10 percent greater than in the previous year and the largest ever attained. But requirements for fats mounted also; it was necessary to take measures to control the distribution of the supply, as well as to maintain and further increase the production.

Goals for 1943 oil crops, which had been announced in late November 1942, were revised upward in January 1943. As revised, the goals called for 45.5 million acres of the four principal oil crops (cotton, flaxseed, soybeans, and peanuts) as compared with an indicated 42.5 million acres in 1942. The goal for cotton was reduced, but the goals for flaxseed, soybeans, and peanuts were increased 1 to 2 million acres each.

To support the production program, the War Food Administration offered guaranteed price incentives. Arrangements between the Commodity Credit Corporation and crushers and refiners provided a floor price for cottonseed. The support price for flaxseed was raised to $2.85, Minneapolis basis, in 1943. The support price for soybeans was raised to $1.80 for green and yellow varieties. A single-price program for peanuts replaced the two-price system in operation for "quota" peanuts and "excess" peanuts in 1942. The new program provided for the marketing of all commercial peanuts through designated Government agencies in 1943–44 at a price nearly $20 per ton higher than the average price in the preceding crop year.

Output of Main Oil Crops

Preliminary reports indicate that farmers exceeded the goal of 5.5 million planted acres for flaxseed by about three-quarters of a million acres. Flaxseed production was the largest ever achieved in this country. It appears the goal of 12 million (harvested) acres of soybeans for beans may not quite be reached; but about 700,000 more acres of soybeans will be harvested than in 1942. The peanut goal of 5.5 million acres probably will not be met, but the previous record (1942) of 3.4 million acres of peanuts picked and threshed will be much exceeded. Approximately 22 million acres of cotton were reported in cultivation July 1, as compared with 23.3 million acres a year earlier. This will mean reduced production of cottonseed oil in 1943–44. Nevertheless, total vegetable oil production may be nearly 10 percent greater than in 1942, and a similar gain in animal-fat production may result from increased hog and cattle marketings.

New Peanut Program

As mentioned above, the peanut program for 1943–44 differs from that of 1942, when a two-price system prevailed.

Under the 1942 program peanuts grown on acreage allotted by the Agricultural Adjustment Agency, known as "quota" peanuts, were marketed to the edible peanut trade under very favorable price conditions. Peanuts grown on other acreage, known as "excess" peanuts, could be sold only to crushers or to agencies designated by the Government.

In June 1943 WFA revoked the marketing quotas and acreage allotments for 1943-crop peanuts. The Commodity Credit Corporation became the sole purchaser of 1943-crop farmers' stock peanuts other than those used for planting or processed by growers on the farm, and operated the program through contracts with handlers, including producers' cooperative associations, crushers, and shellers. This arrangement provided guaranteed prices for the growers at an average of $140 per ton for Spanish and Virginia type peanuts and $130 per ton for the Runner type, with differentials for grade.

Farmers' stock peanuts purchased by the Corporation are being sold both for crushing and for cleaning and shelling. Prices received by the Corporation for peanuts for crushing will average about $90 per ton, the reflection of the value of peanut oil and meal at ceiling prices. Peanuts for cleaning and shelling are being sold at prevailing market prices. Profits to the CCC from sales to cleaners and shellers will be used to cover losses from sales to crushers and defray other costs of operating the program such as inspection, handling, and storage.

Control of Imports

Imports of oils and oilseeds have been placed under control. The Combined Food Board announced in September 1942 that an agreement had been reached providing for exclusive purchase of fats, oils, and oilseeds for the United Nations by the United States in certain prescribed regions of the world and by the United Kingdom in other areas. Supplies thus purchased will be allocated among the United Nations, in line with recommendations made from time to time by the Combined Food Board and accepted by the Governments in question. This plan is now in effect.

The original agreement provided that the United States would be the exclusive purchaser, on behalf of the Governments adhering to the agreement, of (a) all oilseeds and oils and fats in the North and South American Continents, including the Caribbean islands, with the exception of animal fats in Argentina and Uruguay, (b) copra in Tahiti and all Fighting French Pacific islands, (c) all oilseeds and oils and fats in Portuguese Africa, Spanish Africa, and Liberia.

The United Kingdom was designated the exclusive purchaser, on behalf of all the adhering Governments, of (a) all animal fats in Argentina and Uruguay, (b) all oilseeds and oils and fats in British Empire countries except those located in North or South America (including the Caribbean islands), (c) all oilseeds and oils and fats in Fighting French Africa and the Belgian Congo.

Commodity Credit Corporation has been designated the sole Government agency for the importation of fats and oils into the United States.

Conservation of Supplies

To conserve supplies and to provide for orderly procurement by the military and lend-lease authorities, manufacturers' use of fats and oils has been restricted by a general limitation order. This order, which became effective in the last quarter of 1942, was originally issued by the War Production Board, on the recommendation of the Foods Requirements Committee. Enforcement of it has since been transferred to the War Food Administration.

Manufacturers of margarine, shortening, cooking and salad oils, soap, paint, varnish, lacquer, linoleum, oilcloth, felt-base floor covering, coated fabrics, and printing ink may use fats and oils only up to specified percentages of their use of these materials in 1940 and 1941, except in the manufacture of products for military and lend-lease purposes. In most cases, the permitted use for civilian goods is less than the average use in 1940–41. In the case of margarine, however, a considerably larger quantity of fats and oils is available, to compensate in part for the current shortage of butter.

Several allocation and direct limitation programs have been instituted for specific oils and fats in short supply, such as the imported "lauric-acid" oils—coconut, babassu, and palm-kernel—essential to certain war industries and high in glycerine content. Palm oil, tung oil, oiticica oil, sperm oil, cashew nut shell oil, castor oil, rape oil, and mustardseed oil have been placed under control. Cottonseed, soybean, peanut, and corn oils, among the edible items, as well as linseed oil, fish oils, lard oil, oleic acid, and inedible tallow and greases, are later additions to the list.

Manufacturers of creamery butter, federally inspected lard and rendered pork fat and linseed oil were required during part of this year to offer specified percentages of their current output for sale to the Government, in order to facilitate procurement of these items mainly for military and lend-lease purposes.

Rationing of Food Fats

Consumer rationing of food fats went into effect in March last. On the recommendation of the War Food Administration, the Office of Price Administration inaugurated direct rationing of food fats and oils to retail consumers and also to institutional and industrial users. Butter, margarine, lard, other shortening, and cooking and salad oils were procurable thereafter only with red stamps on a point-rationing basis, along with meats, cheese, canned fish, and canned milk. The rationing applied to manufacturers of bakery products, confectionery, mayonnaise and salad dressings, and other products containing added fat. On an annual basis, however, the total civilian ration was only moderately below previous consumption per capita —approximately 44 pounds as compared with about 50 pounds per capita in the early war years and 48 pounds per capita in the immediate pre-war years.

Purchases for Lend-Lease

It has been imperative to provide increasing quantities of fats for lend-lease uses. World production and trade in fats and oils have been seriously disrupted by the war. Surplus-producing areas in the Far East have been cut off to the Western World, whale-oil production has been practically eliminated, shipping to and from South America, Africa, India, and Australia has become very uncertain, and production of animal fats and oils in continental Europe, including part of Russia, has been greatly reduced. The United States has provided an increasing share of the fats supply to the United Kingdom, Russia, and the British forces overseas, but the call may increase. Shipments for European relief may soon be important. In the first 8 months of 1943, purchases of fats and oils by the War Food Administration, mainly for lend-lease, amounted to 1,251 million pounds, nearly twice the quantity purchased in the same period in 1942.

Upward Revision of Ceilings

Price ceilings on fats and oils, instituted by the Office of Price Administration in December 1941, had to be revised upward on several occasions in 1942. Butter, previously not covered, came under maximum price control in October 1942, and linseed oil in May 1943. Ceiling orders now cover all fats and oils. The index number of prices of 8 domestic fats and oils (1910–14=100) advanced from 109 in 1941 to 142 in mid-1943; yet despite this advance, these prices are still lower than they were in 1918, the corresponding year of World War I.

Prices received by farmers for soybeans and peanuts were placed under ceilings in February 1943. Flaxseed was added in May, with ceilings stated in terms of terminal-market prices. Cottonseed is not covered by maximum price regulation. Sales of soybeans, peanuts, and flaxseed for seed are exempt from maximum price control.

CHANGES IN THE DEPARTMENT

From the beginning of the war emergency, the Department of Agriculture functioned as a food administration, though not until December 5, 1942, was official responsibility for the Nation's food program delegated to the Secretary of Agriculture. Under the terms of Executive Order No. 9280, the Foods Requirements Committee was replaced by a Food Advisory Committee composed of the heads of agencies concerned with the food program. The Secretary was made chairman of this committee and a member of the War Production Board, and the powers of that agency with respect to food were transferred to him. The Secretary and the Chairman of the War Production Board were instructed to work cooperatively in determining the amounts and types of nonfood materials, supplies, and equipment necessary for carrying out the food program. Likewise, the Secretary and the Chairman of the War Production Board were to work cooperatively in adjusting the relative demands for the movement of food and for other commodities.

To facilitate the effective discharge of the Secretary's responsibilities under the Executive order, the President announced a reorganization within the Department of Agriculture. All agencies concerned with the production of foods and fibers were united under a Director of Food Production. Similarly all of the agencies concerned with the processing, storage, allocation, and distribution of food were consolidated under a Director of Food Distribution.

Functional Reorganization Effected

Subsequently, the Commodity Credit Corporation was directed to operate at the behest of and in close cooperation with the Food Production and Food Distribution Administrations in carrying into action departmental policies. Two agencies of the Agricultural Research Administration, the Bureau of Home Economics and the Division of Protein and Nutrition Research of the Bureau of Agricultural Chemistry and Engineering, were consolidated to form a new Bureau of Human Nutrition and Home Economics on February 21, in order to provide an enlarged focal point for the nutrition and food research that is vital in ensuring an adequate diet to civilians and the armed forces under war conditions. Shortly thereafter, on March 6, by Executive order the Nutrition Division of the Office of Defense Health and Welfare Services was transferred to the Food Distribution Administration.

By Executive Order No. 9322, dated March 26, 1943, the President consolidated the Food Production Administration (except the Farm Credit Administration), the Food Distribution Administration, the Commodity Credit Corporation, and the Extension Service into an

Administration of Food Production and Distribution within the Department of Agriculture but under the direction and supervision of an administrator who is responsible directly to the President. On April 19, 1943, by Executive Order No. 9334, the President provided that in order to carry out the provisions of Executive Order No. 9322, the Secretary and the War Food Administrator (a change in title) should each have authority to exercise any and all of the powers vested in the other by statute or otherwise.

PERSONNEL ADMINISTRATION

As during the fiscal year 1942, the past year has witnessed significant changes in personnel work in the Federal Government, which have required an increase in the activities of Federal personnel offices. They have reflected the necessity of meeting the Government's manpower problem, and of bringing its personnel policy into line with national needs in time of war. The Civil Service Commission has been compelled to issue new rules, regulations, and procedures and to amend many old rules, so as to comply with War Manpower Commission directives and Congressional mandates, and to achieve increased decentralization of its activities.

The Department has been affected accordingly. Loss of Experienced personnel, reductions in funds with which to carry on required work, and large-scale reorganizations within the Department have created many difficult problems for the Office of Personnel. Some of the laws, orders, and regulations which increased the supervisory activities of the Office of Personnel during the past fiscal year, are as follows:

1. Public Law 694, Seventy-seventh Congress, approved August 1, 1942, providing for pay adjustments and other changes.
2. Executive Order No. 9243, dated September 12, 1942, providing for the transfer and release of Federal personnel, and the War Manpower Commission Directive issued thereunder.
3. Executive Order No. 9350, dated October 3, 1942, regarding wage and salary stabilization in the case of such wages and salaries as are not fixed in accordance with the Classification Act of 1923, as amended.
4. Executive Order No. 9280, dated December 5, 1942, as amended by Executive Order No. 9322, dated March 26, 1943, and Executive Order No. 9334, dated April 19, 1943, creating a War Food Administration.
5. Public Law 821, Seventy-seventh Congress, approved December 22, 1942, and Public Law 49, 78th Congress, approved May 7, 1943, and the Executive orders and rules issued pursuant thereto on the subject of overtime compensation, hours of duty, and personnel ceilings.
6. Executive Order No. 9309, dated March 6, 1943, regarding the control of Government requests for the Selective Service deferment of Federal employees.
7. Special Regulations for the Separation of Employees by Reason of Bureau of the Budget Letter dated March 24, 1943.
8. Civil Service Departmental Circular No. 257, Revision 2, dated April 13, 1943, regarding authority, procedure, and standards for changes in status of employees within executive departments.
9. Special reports to Congressional commitees such as the Joint Committee on Reduction of Nonessential Federal Expenditures, the House Committee on the Civil Service, the Agricultural Subcommittee of the House Committee on Appropriations, and the House Committee on Military Affairs.

The Office of Personnel has increasingly delegated the appointing power, and decentralized the employment and classification functions to a greater extent. The purpose is to permit appointments and other personnel actions to be made as close as possible to the spot where the work is to be done.

Success in the administration of the Department's programs requires proper organization and personnel management at all levels. The Office of Personnel during the past year has engaged in the most active work of this sort in its history, incident to the Executive order of December 1942 which established the Food Production Administration and the Food Distribution Administration, and the Executive order of April 1943 which established the War Food Administration. These changes directly increased the work load of the Office of Personnel. Reorganizations involved 180 branches, divisions, sections, and offices throughout the Department. There was a corresponding increase in position-classification work. Through the use of class specifications and standard position descriptions, the Office of Personnel was able to maintain the necessary flow of work.

The turn-over rate caused by the entry of Department employees into the armed forces, and by their transfer to other war-important assignments, brings to focus the emphasis which must now be placed on replacement training, and on the improvement of supervision through work-improvement programs. In the field of personnel relations, there has been an increase in the number of grievance cases reported to the Office of Personnel. In fiscal year 1943, 128 such cases had to be dealt with through Department grievance procedure, as compared with 62 in fiscal year 1942. There was also an increase in the field of personnel and special investigations, and in disciplinary work, as a result of the current abnormal employment situation.

One of the most practical ways to increase economy and efficiency at this time is the health-conservation program, which prevents sickness, eliminates or controls hazards in working environments, and reduces the loss of working time. The Office of Personnel is therefore paying increased attention to this program.

TENTH YEAR OF THE AAA

In 1943 the Agricultural Adjustment Administration rounded out 10 years of service and proved that its machinery for helping farmers to solve peacetime economic ills is equally effective in helping farmers in wartime production. Farmers won their 1943 battle of production. For the seventh successive year they broke all previous food-production records. They won their battle because like soldiers in a good army individually and as a group they knew their obpectives and were organized for action.

The AAA's national organization of farmer committeemen provided each individual farmer the means for joining his own production effort with the efforts of the 6 million other American farmers.

The year 1943 had its good breaks. Most sections of the country had good weather. It was more than good weather, however, that made possible record production of the right kinds of foods and achieved record food production for the seventh time in as many years.

Each farmer could find out from his own community committeeman, a neighboring farmer, what the country needed in over-all war food and what other farmers could be expected to produce. Thus informed, he could draw up a plan of production for his own farm, as his share of the big production job. He could move forward when planting time came, in joint action with all the other farmers.

The farmer committeeman organization had been the mainspring of the AAA programs since 1933. Approximately 100,000 committeemen, elected by the farmers themselves, had gained experience in helping their neighbors work together on jobs they were unable to handle individually. In pre-war years when there were not enough markets to take all the farmers produced, the committeemen helped farmers divide up the available markets fairly by using marketing quotas. In addition the committeemen administered acreage allotments which enabled farmers to carry out necessary production adjustments equitably. The Ever-Normal Granary, designed for peace as part of the AAA program, became America's first wartime mainstay.

The AAA committeeman's war job in 1943 was bigger and more difficult in many respects than any he had undertaken before. Nevertheless it was a job for which he was ready and well prepared. The first step was to translate national needs into terms that would tell each farmer what might be his own maximum contribution. The next step was to provide the farmer with as much assistance as possible.

After the national needs were converted into State and county production goals, committeemen undertook a farm-to-farm canvass. They talked with each farmer about national food needs for fighting

a world-wide war. The farmer learned of over-all needs and of what could be expected from other farmers in all parts of the country to help meet those needs. With this information the farmer and the committeeman figured out how this farm could help most in meeting the national food needs.

THE INDIVIDUAL FARM PLAN

After considering various production factors such as soil, climate, available labor and machinery, and the farmer's production experience, the farmer worked out his farm production plan for 1943. That farm plan, representing the farmer's own ideas of what he could produce, was to serve as an operating guide for him throughout the season.

Production of the right kind required encouragement of some crops and discouragement of others. It was vital to head off wasteful expansion of the less essential crops. Commodity loans, crop-adjustment payments, and crop insurance served to make production of the needed crops more attractive. The committeemen were local administrators for phases of the program that had to do with allotments, commodity loans, and crop insurance. They had numerous other jobs. AAA State and county committee chairmen, for example, headed up the USDA War Boards, which coordinated all Department of Agriculture work in the States and counties. Committee chairmen had charge of farm machinery rationing, and farm transportation programs. They helped with the local administration of price-supporting measures, war crop loans, feed and seed distribution, and many other war programs, such as the midsummer corn-marketing program.

In June practically no corn was moving to market, and some corn-processing plants were forced to close down. AAA committeemen in Corn Belt States explained the urgent need for corn, and told farmers that the Government had pledged itself to pay farmers the difference in price on corn marketed before the tenth of August, if the price should increase before October 31. Many committeemen took time out from their own farm work to explain the corn situation. Farmers patriotically responded. As a result of the committeemen's action, 43,000,000 bushels of corn were moved to market—10 million bushels more than enough to supply industrial needs.

Conservation Pays in Production

AAA conservation practices promoted larger and more efficient production. In fact this important part of the program became vital. Unprecedented demands for food and fiber necessitated practices that would bring immediate higher yields per acre, and the requirement meant a bigger job for the local committeemen because a program of conservation practices had to be tailored for each area and sometimes for each farm. Because they knew the problems of their own communities and knew what practices to encourage, committeemen consequently were given greater latitude in determining practice specifications and payment rates.

Special attention was given to practices that prevent wind and water erosion, increase range and pasture forage, make possible the best use of water supplies, and save and improve soil. Many such practices had been built up extensively in previous years. The application of limestone and phosphate, which improves the soil and results in greater per-acre yields, is a significant example. From 1936 through 1942 the total amount of limestone used by participants in the AAA program in continental United States was 63,915,000 tons. This rose from 3,620,000 tons in 1936 to 18,971,000 tons in 1942. The total phosphate (converted to a 20 percent basis) applied by cooperating farmers from 1936 through 1942 was 4,150,000 tons. This increased from 121,000 tons in 1936 to 1,173,000 in 1942. The year 1943 shows a further increase although final figures are not available at this writing.

Since the conservation program was put into operation in 1936 yields have increased. The 1937 yields, for example, were 18 percent higher than the 10-year average, 1923–32. In 1938 and 1939 yields were 14 percent above the average. In 1940 there was a further increase to 20 percent above the average; in 1941, to 22 percent above; and in 1942, to 37 percent above the average. There was a drop this year as a result of unfavorable weather conditions; even so they ran above those of any previous year except 1942. Improved seed varieties and favorable growing weather contributed to the increased yields during recent years. But a large part of the increase can be traced directly to conservation methods of farming.

United Effort To Continue

As farmers enter the 1944 production season, the need for united effort will grow. Plans for the coming year will call for a still closer working relationship between farmers and the AAA committeemen. Food needs will be greater and production handicaps will be multiplied. It will be imperative to make every farm and every acre count. Along with local administrative responsibility for many war programs, committeemen will again have the job of helping to inform their farm neighbors of the wartime needs for production of specific crops, and of encouraging them to use their land resources wisely.

EXTENSION ACTIVITIES

Extension work, the principal means developed in the United States for communicating scientific agricultural knowledge to farm people, has a staff of specialists on both State and Federal levels who keep in touch with research bureaus, agricultural experiment stations, new developments in their special fields, and departmental policy and program formulation. They can respond quickly to rural needs and problems.

Extension workers cooperate also in administrative and fiscal matters as between the Department and the State agricultural colleges, particularly in relation to the work of county agricultural, home demonstration, and 4-H Club agents. They have close contacts with county agents, who in turn are in immediate touch with farmers. This system, geared to the objective of food production for Victory, was of immense benefit in 1943. Extension programs helped farm families to produce food to meet their farm goals and supply their home needs as well for the year.

The extension personnel included some 9,000 men and women with professional training in agriculture and home economics; some additional temporary appointees under the farm-labor program; 948,945 adult extension voluntry leaders; and 153,380 boys' and girls' 4–H Club leaders. These people served as educators, advisers, and organizational aids in the wartime food drive. They conducted extension programs on all aspects of the agricultural effort from main-crop planning to the details of a thousand side lines.

Elasticity of organization and programs permitted a wide range for adapting extension activities to local needs and varying situations. For example, poultry specialists advised and assisted farmers and also back-yard poultry keepers in producing poultry and eggs. Specialists in horticulture helped commercial orchard men, promoted farm Victory gardening, and cooperated with urban groups in planning Victory Gardens. Much extension work involved close cooperative relationships with councils of defense and local civic groups, notably in salvage campaigns, consumer information work, and farm-labor mobilization.

Origin of Extension Assignments

Assignments for the extension people grew out of the Department's production-capacity studies and out of the establishment of National, State, and county goals for agriculture. After goals had been set for States, counties, and communities it was necessary to assist individual farmers in making adjustments on their own farms. Extension agents helped farmers to think through their special problems, to figure out the required crop adjustments, to fit their war tasks into the long-time programs of their farms, to analyze the outlook for prices

and production costs, and to obtain necessary labor, machinery, and supplies.

Problems arose in connection with the increasing scarcity of machinery, of protein supplements, and of fertilizer. These problems necessitated many farm adjustments in the areas affected, and extension people cooperated with farmers in handling the details. They assembled requirements data, worked with feed, seed, and fertilizer dealers on distribution problems, helped in tractor and other machinery-repair programs, promoted cooperative use of equipment, and smoothed out local tangles in farm storage and transportation. Cooperatively, the Federal, State, and county extension workers reviewed the entire farm effort, checked weak spots, promoted the adoption of improved farm practices, and looked ahead with farmers to the post-war era.

Labor conditions became an important influence in shaping project emphasis. Dairy extension work, for example, aimed at increasing milk production chiefly by reaching the small producers with information on improving feed supplies and better herd management. Special appeals to farmers having from 4 to 10 cows were made over the radio, through local newspapers, and through local milk and cream stations. Similarly poultry extension men helped poultry breeders meet the labor and supply shortage by suggesting labor-saving management practices and issuing plans for home-made equipment. In Louisiana alone over 2,000 home-made lamp brooders were constructed.

Special Requirements Emphasized

Farm practice and farm-management programs emphasized the overhauling of farm schedules in the light of changes necessitated by the war. The need for oil crops, for example, demanded new enterprises on thousands of farms. Fuel and rubber shortages brought extension people into planning for truck pooling and other transportation adjustments. Priorities on essential materials made new farm machinery scarce and posed problems in machinery rationing, distribution, maintenance, and joint use. Scarcity of certain fertilizers, insecticides, and fungicides produced calls for extension help in developing suitable farm adjustments or in reviving forgotten practices to maintain soil fertility and discourage pests. The necessity for employing inexperienced hands on farms created farm employee training problems which the extension force helped farmers to solve. As mentioned in another part of this report, the first step necessary was employer rather than employee training.

Material assistance was given by the Extension Service in encouraging cooperative practices that can bring about production increases in certain lines. Participation in cooperative breeding associations showed an increase of 150 percent in herds and 100 percent in cows compared with a year earlier. A Victory Cockerel Campaign launched by the National Poultry Improvement Plan workers, which includes many extension poultrymen, resulted in saving thousands of the better bred cockerels whose blood lines will increase the rate of egg production for the 1944 season.

Scientific Help Provided

Close cooperation with scientific activities aimed especially at protecting plants and food products from insect or disease damage. Extension workers aided entomologists and plant pathologists in promoting the treatment of seeds with chemical disinfectants and protectants, and in encouraging farmers and home gardeners in other practical methods of plant protection against insects and diseases. The American Phytopathological Society, composed of some 1,100 professional workers in plant pathology, set up a war committee, one of the functions of which is to make readily available all present information that will help control plant diseases. The society is promoting further extension work in this field and extension workers are helping farmers to stop plant losses through disease.

With the demand for production of our hemp for cordage and twine, it was discovered that our limited supply of Kentucky-grown seed emerged from the ground better and gave more uniform stand if treated with a dust infectant. Those in charge of the hemp-production program urged treatment of the 200,000 bushels of seed before it was sown in the Midwestern States. Considerable organization and supervisory work was given to this project by extension specialists.

Neighborhood leaders in the extension program emphasized food production and helped in programs for meat rationing, producing the farm-family food supply, recruiting emergency farm labor, salvaging metals and rubber, promoting war-bond sales, repairing farm machinery, organizing marketing and transportation, and preventing farm fires and forest fires. In many States home demonstration leaders helped to instruct urban Office of Civilian Defense block leaders in nutrition and food conservation. All told, more than 600,000 farm men and women and farm youths were serving as extension neighborhood leaders. Extension workers conducted training programs for farm neighborhood leaders and cooperated in the training of urban block leaders.

Health, Nutrition, and Consumer Programs

All-out food production on American farms requires family health and fitness. A prime essential for good health is good nutrition, based on an adequate diet. Urging more food production for consumption in farm homes as a means to this end, the Extension Service emphasized better planning of food production and food utilization. This program produced notable results throughout the country. It included wide distribution, through county extension offices, of a handbook prepared by the United States Extension Service entitled "Victory Farm Home Food Supply Information Handbook." Home demonstration agents and other groups suggested food-preservation methods. In a "roll call" drive farm women pledged themselves to grow and preserve as much food as possible. This roll call covered nearly all of the States and also Alaska and Puerto Rico, and contributed materially to the increase in home food growing on the farm. Upwards of 7 million rural families produced greater amounts of their own food supplies this year than previously.

Production and nutrition specialists promoted the planning and production of the family food supply. They reemphasized good food habits, meal planning to include the seven essential food groups, and cooking methods which conserve minerals and vitamins. They promoted the production and use of vegetables high in food value, such as particular varieties of table soybeans, peanuts, sweetpotatoes, and tomatoes, and certain leafy vegetables, and the local grinding of whole-grain cereals and flour, cane sirup, and sorghum molasses.

As the domestic food situation tightened, home demonstration workers explained the impact of war needs upon the civilian food supply, and the factors involved in rationing, price ceilings, and food standards. They promoted the intelligent and cheerful use of less scarce foods of similar food value to relieve pressure on foods in greater demand.

Much progress toward greater food production was made among Negro families in the rural South. Previous educational work with Negro small farmers bore good fruit, and better feeding of plantation workers resulted. These programs brought a growth of understanding, among both plantation owners and workers, of the part food plays in the physical fitness of workers.

Farm Records: Marketing Assistance

Extension efforts increased the interest of farmers in farm records and the information they provide. Such records furnish guidance in farm-adjustment plans and data necessary in making income tax returns. More farmers started farm record books than ever before and asked extension help in learning record-book technique. The number of farmers who had to file income tax returns increased. Accordingly, extension workers cooperated with the Bureau of Internal Revenue in the solution of farm problems associated with income tax reporting.

Farm families sought extension help also in developing wartime programs in farm finance. What to do with their increased income was a major problem, in view of the probable temporary nature of the present situation. As the Extension Service emphasized, the supreme need was to avoid letting increased farm returns go into speculation in land. The creation of reserves to weather possible financial storms received much attention in the analysis of current farm finance.

Agricultural marketing and distributing facilities have not increased proportionately with wartime farm production, and in some instances have actually decreased. Shortages have developed in transportation, storage, processing facilities, containers, and other supplies. In consequence the Extension Service has participated in special merchandising programs, in efforts to clear channels of trade, in the development of new market outlets, and in supplying basic market information. It has worked with farmers in studying or handling other matters that affect marketing and distribution, such as farm aspects of rationing, priorities, allotments, price ceilings, price floors, and other price orders and regulations, and has cooperated with the Food Distribution Administration and with farmers in the develop-

ment and operation of surplus-removal programs on a local, State, and regional basis. Extension activities in the field of marketing have promoted the Food Distribution Administration egg-buying program in 13 Southern States, the school-milk program, and milk-marketing orders and agreements.

Meetings and programs under Extension Service guidance have helped to improve the quality of products sent to the markets and to assist farmers and dealers in understanding grades and grading factors. Other programs have disseminated information on the need for special types or qualities of farm products to meet war requirements, such as shearling pelts, long-staple cotton, high-oil-content soybeans, and dried milk. More than 9,000 farm cooperative associations have obtained help from the Extension Service in connection with their marketing, storage, transportation, and processing problems, which have been greatly affected by rationing, set-aside orders, priorities, allotments, price ceilings, price floors, and other wartime regulations.

Programs for Rural Youth

Extension workers continued to aid rural young people through the 4–H program. They pointed out that the 4–H Clubs have great significance in relation to the total war effort and are more important even than in peacetime in enabling farm boys and girls to decide wisely regarding matters that may affect their entire lives. Specially valuable is the training 4–H Clubs provide in community undertakings and in the study of national issues in the present world struggle. Quickly adjusted to war needs, the 4–H programs emphasized participation in the family-food effort and also in making the home farm as commercially productive as possible. The programs gave special credit for regular work done on the farm and in the farm home and encouraged father-son partnerships.

More than 1,500,000 4–H members took part in special efforts to enlarge the Nation's food and fiber supply and to store and preserve food. Club members raised Victory Gardens and canned millions of jars of fruits, vegetables, and meats. They helped to relieve the labor shortage on their own farms and in their neighborhoods and cooperated with farm volunteers from urban areas. Club members also served as neighborhood leaders, helped on war committees, assumed special responsibilities in various war campaigns, aided rural fire control, and promoted programs to conserve community resources. They learned and demonstrated practices in first aid, child care, home nursing, canning, meal preparation, care of farm machinery, dairying, and poultry raising. They gathered thousands of tons of scrap for war materials. They bought millions of dollars worth of war bonds and stamps with money earned through their project work.

Club Members in Varied Service

More than half a million former club members are now in the armed services. Thousands of current members, both boys and girls, are driving tractors for the first time, doing other work in the production of food, doing civilian defense duty, and cooperating in programs to

buy ambulances, war planes, and even ships on a 4–H Club basis. Money collected by 4–H members has purchased seven ambulances already. Through war-bond and food-production campaigns, 4–H Club members in Georgia built a Liberty Ship christened the S. S. *Hoke Smith*, and pledged themselves to grow enough food to fill it. As club members set higher goals and work harder to reach them, they show a stronger general desire to be of service, more ability to get along with others, and more readiness to meet whatever they may have to face.

FARM SECURITY

Activities of the Farm Security Administration were concentrated even before the war began on the aim of getting greater food production from the small farms operated by families receiving FSA financial and supervisory assistance. The original FSA objective, rehabilitation of low-income farmers, became synonymous with the objective of increased production.

In the fiscal year 1943 the borrower families made greater strides in production and rehabilitation than in any previous year. They increased their net income and their net worth to more than double what it was when the program was started in the depression years of the 1930's. In stepping up food production they acquired skill and experience, took on new enterprises, earned better incomes, improved their living conditions, and achieved added security.

Loans for Increased Production

The war's demand for food gave families on the rural rehabilitation program their first real chance to produce for the commercial market. It gave the farm ownership borrowers, participants in the so-called "tenant-purchase" program, an opportunity to expand their farming in line with national goals, increase their earnings, and make unusually rapid progress toward retiring their obligations.

With the help of FSA county supervisors, the borrower families followed individual, written farm plans. They planted new crops, added more livestock and poultry, learned better farming methods, and adapted their work to war needs and conditions. They utilized more fully their family labor and frequently traded work with their neighbors. Altogether, the farms of the 463,941 active rehabilitation and farm ownership borrowers furnished 38 percent of the Nation's milk increase in 1942, 17 percent of the additional dry beans raised, and large shares of the additional supplies of chickens, eggs, beef, pork, peanuts, and sugar beets. Thus prepared for increased participation in the national food campaign, they adopted new and higher goals for 1943. The increases aimed at ranged from 20 percent to 72 percent over the 1942 record.

New enterprises on borrower farms account for some of this expected production increase. Sixty-nine percent of all FSA borrowers planned to produce beef this year, as compared with 57 percent in 1942 and 48 percent in 1941. On an average each family planned to raise 1,912 pounds of beef, as compared with 1,075 pounds in 1942 and 1,462 pounds in 1941. Thirty-one percent raised peanuts in 1943, as compared with 28 percent last year and 19 percent in 1941. The estimated production of this essential-oil-bearing crop from the average FSA borrower's farm was 2,577 pounds, almost twice the amount it pro-

duced before the war. Ninety-eight percent of the borrowers now list milk as one of the war-essential foods produced on their farms. The amount of milk produced on Farm Security borrowers' farms in 1942 was 20 percent higher than in 1941, as compared with the 3 percent increase recorded for all farms in the Nation. Ninety-six percent have laying hens, and expect to have an average egg production of 662 dozen eggs per farm in 1943. The increase in egg production in 1942 was 31 percent, as compared with the 15 percent increase achieved by all farmers.

Resources of Small Farms

Small farms such as those operated by Farm Security borrowers have important resources for expanded agricultural production. The one-third of the Nation's farms which produce 84 percent of the agricultural commodities that go to market will continue to be the source of most of the total commercial food production. These farms, however, are already producing at near capacity. Families on the FSA program, on the other hand, have not reached their peak production, and generally they have no shortage of labor. The small farmer finds he can milk 8 cows instead of 2 with family labor already available. He can keep 20 pigs instead of 10. As the demand increases for additional food supplies for the armed forces and shipment overseas, the Nation will depend more and more on the smaller farms.

Operating loans for the purchase of livestock, equipment, and other farming essentials were made during the fiscal year to 51,015 families who had not previously been on the program, and supplemental loans were made to 198,705 already on the program. A total of $97,255,090 was advanced in loans from rehabilitation funds.

The Collection Record

The collection record in fiscal year 1943 was the best in the history of the FSA. From the beginning of the program to June 30, 1943, nearly one million families had borrowed $778,522,696 in rehabilitation funds, and of this amount, $104,327,655 had come due. Eighty-eight percent of the total maturities on these supposedly "high-risk" loans had been repaid, and enough advance payments had been received to bring collections up to 93 percent of the maturities. In addition, $49,085,380 had been paid in interest. More than 260,000 families had repaid their debts completely. They were on their feet again as independent operators and drawing their credit from commercial sources.

For the fiscal year 1942–43 collections totaled $128,720,775, or nearly a third more than the total amount of the $97,255,090 which had been loaned during the year.

The borrowers' prompt repayments to the FSA are reflected in the record of repayments made by the FSA to the Reconstruction Finance Corporation. From July 1, 1940, when RFC funds were first used for rural rehabilitation loans, through June 30, 1943, the FSA had borrowed a total of $332,315,000 from the RFC, and had paid back $271,759,029 in principal and interest. The balance of approximately

$62,000,000 still owed to the RFC on the past year's obligation is secured by borrowers' notes totaling approximately $416,000,000, a ratio of more than 6 to 1.

Farm Ownership

Under the Bankhead-Jones Farm Tenant Act, the FSA has made farm ownership loans to 33,559 selected farm tenants and farm laborers to enable them to purchase family-type farms of their own. Of these borrowers, 5,144 obtained their loans and bought their farms in the past year.

Through June 30, 1943, a total of $191,487,749 had been loaned under this program, and $18,807,447 of this amount had fallen due. The total collections, including refunds and proceeds from sales of timber or mineral rights, were $24,496,036. Under the variable-payment plan, which enables the borrowers to make larger payments in good years and smaller payments in poor seasons, collections were far ahead of the amount that would have been due under the fixed-payment plan. During the past year, those using this plan paid back the equivalent of a year and a half's payments in 12 months. Repayments against maturities, which include the increased billings under the variable payment plan, were 98.4 percent of the amount billed.

Today, FSA farm ownership borrowers rank among the most efficient producers on family-type farms, with an average rating of 24 war units per farm. They have labor and facilities for full production.

Although they have 40 years to repay their loans and the program has been in operation only since 1937, already 187 borrowers have paid in full, some from earned farm income, some with the aid of proceeds from sales of timber and mineral rights, and others when the Government bought their land for military purposes. More than 2,000 borrowers made payments of $1,000 or more out of the 1942 farm income alone.

Other FSA Programs

Sound credit and technical farming assistance are accompanied by various other types of aid necessary for efficient production by small farmers.

Through group-health plans, worked out in cooperation with physicians in more than a third of all counties in the United States, more than 110,000 farm families, or about 572,000 persons, are getting medical care by paying annual fees they can afford. Besides general physicians' care, services often cover emergency surgery, limited hospitalization and prescribed drugs, and, in many cases, emergency dental care.

More than 200,000 families are members of some 18,000 community services started with FSA help. Thus they share the cost and use of essential livestock and equipment which none of them, alone, could afford to own. About 11,000 of these services provide farm machinery, and nearly 5,000 provide good sires to improve dairy herds or work stock. Another important type of cooperative activity is the county-wide purchasing and marketing association. More than 1,400

such associations had been organized by June 30, 1943. Through them, families buy quality seed, fertilizer, feed, and other supplies usually at price savings, and sell their farm products at greater advantage than is possible individually.

Voluntary debt adjustments have been made with creditors for more than 187,000 farmers to enable them to carry on, and 80 percent of the tenants on the FSA program now have written leases, a large proportion of them for 2 or more years.

During the latter half of the 1942–43 fiscal year, the FSA county supervisors acted as agents for the Commodity Credit Corporation to buy up approximately 34,000 dairy animals which otherwise would have been slaughtered. Cows needed for milk production were then resold to other farmers who had sufficient feed, labor, and barn space to handle them.

Liquidation of Resettlement Projects

The resettlement projects, nearly all of which were begun by other agencies as experiments during the depression and turned over to the Farm Security Administration for management, are being liquidated in an orderly manner. Low-income farmers residing on the project farms have the first opportunity to buy the units.

The 42 nonfarm projects were transferred to the Federal Public Housing Authority on October 1, 1942, in accordance with an Executive order. The 9,218 units in the 152 farm projects which remained under FSA management were being disposed of rapidly, and more than half of them had been sold to resident operators by the middle of 1943.

Emergency Aid in Flooded Areas

The Farm Security Administration again was called on to provide emergency help to farmers when disastrous floods covered the farm lands of many midwestern counties in May. All facilities of the Department of Agriculture quickly were utilized to relieve distress and help farmers get back into essential production. The Farm Security Administration transferred unused funds from other regions to the flooded States. This procedure made $235,000 available for grants and about $780,000 for loans to flood sufferers in Indiana, Illinois, Missouri, Arkansas, Oklahoma, Kansas, and Ohio. The FSA county supervisors issued small grants, usually $30 or less, to provide emergency food, shelter, and medical attention for homeless farm families.

After the floods receded, FSA made loans to farmers who lacked other credit resources, to put in new crops, and FSA supervisors helped them to readjust their operations so that the season would not be lost. Where cottonfields had been ruined, peanuts and soybeans were the usual replacement crops. Some farmers made up for crop losses by planting feed crops and getting more livestock. Practically all families in the flooded areas who had been on the FSA program were able to make the necessary adjustments and continue farming. Only a few left their farms for other employment.

OUR FORESTS IN THE WAR EFFORT

The work of the Forest Service was carried on throughout the year with constantly decreasing and shifting manpower. With a number of emergency war projects to be manned, such as the Emergency Rubber Project and the Alaska Spruce Log and War Mapping Projects, the Service eliminated or reduced to a maintenance basis as many as possible of those activities not essential to prosecution of the war, and reassigned released personnel. Occupational deferments from selective service were requested only in cases where the physical or technical requirements of the job made such action necessary.

Forest Service personnel were called upon for many services to the military and other war agencies beyond those set up as definite projects. They directed or aided, for instance, a number of rescues or searches for victims of airplane crashes in mountainous country. Forestry specialists aided the Army in problems of pack-animal techniques, training of mountaineering troops, visibility studies, and camouflage plantings. Several hundred forest lookout stations functioned as key stations in the Army's Aircraft Warning Service.

National Forest Timber Cut

The cut of national-forest timber under commercial sales and of timber given in exchange for land in fiscal year 1943 amounted to 2,359,463,000 board feet—7 percent more than in 1942 and 83 percent more than in 1939. Destructive cutting has been avoided, and nowhere have communities dependent upon a sustained yield of national-forest timber for their existence been jeopardized by the stepped-up cutting for war purposes.

The war demand for national-forest timber is a direct indication of the part that it will play in the post-war era. The trend toward use of publicly owned timber, now that privately owned adjacent stumpage has been heavily cut in many areas, will tend to increase. Shifts in operations in the industry will be inescapable in many places after the war. The wise use of national-forest timber to reduce the shock of such inevitable changes is receiving careful consideration.

Working under the most difficult winter conditions, the Forest Service got under way its special project for the production of high-quality aircraft spruce from the Tongass National Forest in Alaska. The first Davis raft of approximately 1 million board feet reached Puget Sound in January after a 900-mile, storm-beset trip by water. Since then rafts of logs have been delivered to Puget Sound mills at fairly regular intervals, although a shortage of tugs for towing the rafts and difficulties in procuring sufficient manpower have handicapped production.

The Alaska Spruce Log Project was undertaken by the Forest Service at the request of the War Production Board, and is financed by

the Commodity Credit Corporation. Logging is done by operators under contract with the Forest Service.

The project also has been helping to meet urgent needs of the armed forces for ordinary construction lumber in Alaska. Several million feet of lower grade spruce and hemlock have been delivered to mills in Alaska cutting lumber for military needs. These logs are being taken from areas logged primarily for high-grade airplane spruce. However, the project has been able to supply sufficient timber to enable these mills to operate continuously, and every foot of lumber produced locally for the use of the armed services in Alaska saves shipping space which would otherwise be required to bring this lumber from the States.

Livestock on Forest Ranges

Range lands within the national forests continued to contribute to wartime production of meat, wool, and leather supplies. The current high populations of livestock and the shortage of feeds caused some demand for longer grazing privileges. These were granted only where it could be done without injury to the range. During the last war, many ranges were damaged when unreasonably heavy stocking occurred in an effort to increase yields through greater numbers of animals. During this war better results are looked for through proper stocking and higher weights per animal.

At the request of the Public Roads Administration and the War Production Board, the Forest Service undertook 103 construction projects during the year involving 1,200 miles of road to make accessible timber and minerals needed for war purposes. Thirty-eight of these access roads were to open up timber areas; 65 were to facilitate the operation of mines. Meanwhile only a minimum of maintenance has been done to keep in serviceable condition the existing roads and trails required for protection and administration of the national forests. Considerable construction, improvement, and maintenance work will therefore be necessary after the war to bring the road and trail system to a satisfactory standard.

Cooperation With Armed Forces

The Forest Service has cooperated extensively with the Army on problems of special equipment needed for military operations. An outstanding contribution is a midget tractor designed by forest engineers for trail construction, which has been adopted by the Army as the motive-power unit for air-borne construction equipment and is also used for the construction of trails, roads, and airfields at advance bases.

At the request of the War Department, the Forest Service has been engaged in two large aerial mapping projects in the West, and recently was assigned a similar project in the East.

Extensive areas of national-forest land have been made available to the military services for training camps, maneuver areas, bombing or target ranges, and other military uses. A number of recreation camps, former CCC camps, and other facilities also have been made

available for convalescent camps or recreational centers for the armed forces.

War conditions have compelled deferment of the program of Federal forest-land purchases. Within existing national forests and purchase units are more than 36 million acres which are not yet in Federal ownership but which should be acquired if these public forests are fully to serve public needs. Outside the established units, there are more than 50 million acres for which a national-forest status is indicated by considerations of permanent public interest and welfare. The program of public forest acquisition should be resumed at the earliest practicable date if the requirements of the post-war era, and of permanent national economy are to be met adequately by the national forests.

Forest Fire Control

Control of forest fires is important in normal times; in wartime it takes on added importance. Forest fires may be as effective as enemy bombs in destroying military facilities and disrupting war work. The military services have requested intensive effort for fire control and have cooperated in many ways with forestry agencies.

The Congress recognized the wartime importance of the fire-control problem by appropriating supplemental funds for emergency forest-fire control for the fiscal year 1943. These funds were devoted to intensified protection in the most critical areas, and were allocated about equally between national-forest lands and cooperative programs with 42 States on State and privately owned lands.

With the cooperation of the War Advertising Council, the State Foresters, and civic and conservation associations, the Forest Service continued in 1943 an intensified campaign for public cooperation in preventing forest fires throughout the country. Cooperation of advertisers and of many other groups and individuals in spreading the message that "Our Carelessness is the Enemy's Secret Weapon" was most gratifying.

The national-forest fire organization continued to suffer a loss of experienced fire-control personnel due to military and other wartime needs for competent manpower. To maintain the fire-control organization, it was necessary to employ and train for seasonal guard or patrol work hundreds of high school students, principally of the 17-year-old class. Women were employed in many instances for duty at lookout stations, fire-dispatcher's offices, and equipment depots. Some 2,000 conscientious objectors in civilian Public Service Camps assigned to the Forest Service were a valuable aid in fire control, as well as in other forest work.

A national volunteer fire-fighting force, organized through the cooperation of the Office of Civilian Defense, constituted a valuable reserve of fire-fighting manpower. Local groups, enrolled by OCD, were trained by Federal and State forestry agencies and organized for service on call in suppressing outbreaks of fire. The volunteer workers proved effective in many instances. By the fall of 1943, total enrollment in the Forest Fire Fighters Service was close to 200,000.

Timber Requirements and Supplies

Some 3½ million farms have woodland acreage, and normally one-third of the Nation's forest products come from farm woodlands. An important phase of the over-all drive for more timber production was a program developed cooperatively by the War Food Administration, the Forest Service, and the War Production Board, to encourage an increased harvest of forest products from farms.

Last year, $223,000 from funds available under the Cooperative Farm Forestry Act, were allotted to the Forest Service for cooperation with the States in the establishment of a forest-products marketing service for farm woodland owners. Seventy projects were set up during the fiscal year involving 280 counties in 25 States. A farm forester is in charge of each project. Eight of these projects are Federally directed; the rest State directed. Cooperation with the States is on a 50–50 basis, and Federal funds in general were allocated to States on the basis of amount of productive farm woodland.

The purpose of the program is to provide assistance to farmers in estimating their timber volume and value and in harvesting and marketing forest products. It has been common practice for purchasers of farm stumpage to make a lump-sum offer for all the timber in the woodland and then to clear-cut. This practice leaves nothing for succeeding crops and makes no provision for the future productiveness of the woodland. Most farmers know little about timber values, and too often sell for only a fraction of the true worth of the timber. The program is popular both with farmers and with purchasers.

Timber Production War Project

At the request of the War Production Board, the Forest Service launched a special project to stimulate the output of forest products needed for war and essential civilian uses. Cooperating in the project were other agencies of the Department of Agriculture, State and extension foresters, and representatives of the forest industries. The War Manpower Commission, the Office of Defense Transportation, and the Office of Price Administration helped in their respective fields.

The Timber Production War Project was undertaken primarily in the States east of the Great Plains. Greatest hope for increased production was from small mills in these States, thousands of which were idle or operating only at a fraction of their capacity. Project foresters were assigned to assist woods owners and mill operators in meeting labor and equipment problems, advise on cutting and marketing, and otherwise aid in promoting a maximum timber harvest.

War Work in Forest Research

Work of the Forest Products Laboratory has been concentrated on providing the research and technical services required for the selection, production, substitution, and efficient utilization of forest products for war and essential civilian uses. The extent and variety of the laboratory's activities are indicated by the following examples.

A total of 50 reports on the properties and uses of wood, plywood, and paper-base and wood-base plastics in aircraft and other war products was prepared for the Army, the Navy, designers, inspectors, and manufacturers. A revised Wood Aircraft Fabrication Manual was prepared for the Aeronautical Board.

The job of solving the packaging, loading, and shipping problems for all ordnance equipment and supplies, assigned to the Laboratory in 1942 by the Army Ordnance Department, was expanded manyfold last year. Existing containers were redesigned or new ones designed and specifications prepared for hundreds of items, including antiaircraft guns, armored trailers and cars, ammunition, mobile shop trucks, rifles, and "bazookas." Besides providing protection to ordnance supplies in overseas shipments, large savings in packaging materials and cargo space are being effected.

At the request of the War Production Board, a pilot-plant investigation was begun to gain experience with a process for the production of wood sugar from wood waste or low-quality timber. Ethyl alcohol or high-protein livestock feed can be produced from the wood sugar. Results so far have been highly satisfactory. Utilization of wood waste as a source of alcohol and protein feed will help conserve our grain supply for domestic and lend-lease needs.

Results of tests in operating a truck with a gasogen (wood gas as a substitute for gasolene) were made available to Government agencies. Consulting aid was given to numerous manufacturers who sought guidance in the use of wood for products made of metals, such as office equipment, lighting fixtures, radiators, bedspring, mattress frames, factory truck wheels and tires. Much work was done on the development of simple methods adapted to small-sawmill operations to reduce labor requirements for handling logs and lumber and to increase the serviceable life of trucks and other logging and milling equipment.

"Papreg," the high-strength, resin-impregnated paper plastic developed at the Laboratory, was adapted to many commercial and military uses, including equipment cases, aircraft parts, and parts for gun turrets.

While all new Laboratory developments are at present directed toward aiding the Nation's war effort, many of them will contribute materially toward peacetime developments when hostilities cease.

Research on planting for camouflage purposes has uncovered leads that should be of permanent value. Chemical treatments that increase the survival of trees under adverse conditions, chiefly by reducing transpiration, may permit planting to be carried on at almost any time during the growing season. This would greatly enlarge the amount of needed reforestation which could be accomplished during periods when surplus labor is available.

Range research on artificial seeding is pointing the way to increased forage supplies in the West. It has also enabled the Forest Service to fill urgent requests for instructions on concealment planting, dust control, and fire hazard reduction at Army and Navy bases, both at home and in foreign combat theaters.

A better understanding of the use of protein supplements in feeding of range livestock opens the way for much greater beef production in the Southeast.

Tropical Forestry Work

All activities of the Forest Service in Tropical America were unified last May under a Director of Tropical Forestry. This brought under one head the direction of the Tropical Forest Experiment Station, the Latin American Forest Resources Project, the administration of the Caribbean National Forest in Puerto Rico, and the cooperative work in forestry with the Puerto Rican insular government.

During the year the Forest Service undertook a tropical timber study in Central America and northern South American countries, with funds provided by the Office of the Coordinator of Inter-American Affairs. Primary objective was to procure information on local woods suitable for bridge and culvert construction on the Pan American Highway, for the shipbuilding program of the Inter-American Navigation Corporation, and for military construction at Latin American cantonments, airfields, and bases. Two survey parties were assigned to the project, one in Costa Rica and the other in Ecuador.

Emergency Rubber Project

The project for production of guayule rubber was started by the Forest Service and cooperating agencies in the spring of 1942 by establishing nurseries in California in which were sown some 21,000 pounds of seed, the total supply of selected guayule seed then in existence. In September, 1942, the President's Rubber Survey Committee, reporting on the increasingly critical rubber situation, recommended expansion of guayule production. The project immediately went forward at an accelerated pace; nursery capacity was expanded, and arrangements made for leasing and planting a greatly increased acreage.

Early in 1943 the Rubber Director and the Secretary of Agriculture agreed upon a halt in expansion of acreage, in order to avoid further diversion of lands and agricultural labor needed for food crops. Later in the year the Rubber Director again recommended substantial expansion of guayule acreage in order to produce up to 20,000 tons of rubber annually as "insurance" for a domestic source of natural rubber. The recommended expansion, if financed by Congress, would be chiefly on non-irrigated land in the Southwestern States.

Field planting up to the end of the fiscal year 1943 totaled 23,470 acres, nearly all in California. Under lease for planting in the fall of 1943 were some 15,000 additional acres. Plantings for experimental purposes aggregating 831 acres were made in Southwestern States. Seven nurseries have been established in California, Arizona, New Mexico, and Texas. Sufficient stock is maintained in these nurseries for rapid expansion of the project if needed.

Following the 1942 test plantings of kok-saghyz (Russian dandelion) the Forest Service initiated an experimental planting program

of 700 acres in 1943. Thirty-five fields were sown with Russian seed in test areas extending from Vermont to Oregon. Extraction processes developed by the Agricultural Research Administration yielded about 5 percent rubber from roots grown in 1942. Analyses of harvested samples of some of the 1943 plantings indicated higher rubber yields. Recovery of several tons of kok-saghyz rubber for testing purposes was expected.

An experimental goldenrod program, based on 650 acres of test planting, was undertaken by the Forest Service in 1943. Most of the planting was in Georgia, although several small plots were established in other Southern States. Goldenrod strains selected by the late Thomas A. Edison and subsequently improved by Department of Agriculture scientists were used in the tests. The records of Mr. Edison's earlier experiments with goldenrod as a source of rubber were turned over to the Department after his death.

Drain on Forest Resources

The second year of war brought increasing indication of the importance of forests and their products in the total war job. Shortages of wood threatened serious bottlenecks in many lines of production. The pressing war demand for wood accentuated the need for wise handling of our forest resource. For more than 50 years the question of the Nation's timber supply has called for solution. With destructive cutting accelerated by the war and continued exploitation at a rate far in excess of current growth, the problem becomes even more critical.

Timber shortage is already a reality in many localities. Some formerly active timber-producing regions now have to depend almost entirely on outside sources for their lumber. During the past year, with the Nation's need for lumber urgent, several large mills have had to shut down, because the saw-timber supply within operating distance had been exhausted. It is significant that the eastern half of the Nation, which includes three-fourths of our total commercial forest area, now has less saw timber than the 6 percent of our forest land in western Oregon and Washington.

It is most encouraging that a substantial number of timber owners, large and small, have adopted forest-management methods looking to a continuing yield of raw material. That timber can be handled profitably under good forest practice is indicated by the fact that many operators are doing so. Those operators who continue to practice sustained-yield management and plan their operations in relation to the productive capacity of the forest, are assured of permanence for their industries. The communities dependent upon those industries may look forward to economic stability because a sustained yield of timber makes for sustained communities.

We must not lose sight of the fact, however, that adequate measures to maintain productivity as yet are being applied to only a fraction of our forest lands. Our best forest lands for the most part are in private ownership, and by and large on private lands the processes of destructive liquidation still prevail.

Public Action Needed

The broad objective of our forest policy is to develop and maintain our forests so that they may continuously yield adequate supplies of forest products and provide other essential services and benefits. If that goal is to be achieved, as it must be in the interest of national welfare, certain public action is imperative.

The public has recognized its responsibility in the protection of forest lands from fire. It has not as yet, however, fully met that responsibility. Under the Clarke-McNary law of 1924, some measure of public aid in fire protection has been given forest owners. Such cooperative aid should be extended to cover all State and private lands needing protection, and protective work should be intensified. Similar cooperative aid should be provided for the control of destructive insects and diseases. Public cooperation in working out woods-management and marketing problems, both for farmers and other timberland owners, will speed the transition from destructive liquidation to sustained-yield practices.

Most of those who are familiar with the problem agree that some measure of public control of forest practice is essential. Current discussion centers largely around what form that control should take —whether direct regulation of timber cutting and other closely related practices by the Federal Government, or control by the individual States. This Department believes that regulation by State action cannot be effective for the country as a whole without strong Federal leadership. Prompt Nation-wide action and reasonable uniformity of regulatory standards can be achieved only by Federal legislation which will prescribe the general standards of forest practice. It should authorize the Secretary of Agriculture to determine the adequacy of State laws and enforcements and to take direct action where States fail to provide and enforce adequate measures.

Public acquisition of substantial amounts of forest land is another important part of the needed forest program. Because of ill-advised clearing of lands unsuited for farming or as a result of destructive logging, fire, and erosion, millions of acres of wasted forest land are no longer attractive to private enterprise. A huge amount of land of this character is chronically tax-delinquent. Restoration of such lands to economic usefulness is clearly a public responsibility. On certain other lands, such as critical watersheds, the public interest transcends all other considerations. Individual owners cannot be expected to undertake the nonincome-producing work the public interest requires. Public ownership is therefore essential.

These are lands on which some of the most pressing needs for forest rehabilitation and protection exist. Many of these lands should be brought into our national-forest system through purchase or exchange. State, county, and municipal forests should also absorb a substantial acreage. Public ownership of such lands will give assurance that improvements and facilities undertaken on them as public-works projects will be adequately maintained and that the public interest will be safeguarded in their management.

FINDINGS OF STATE EXPERIMENT STATIONS

Pressure on land resources and on the supply of labor and machinery obliges farmers to make greater use of science in their war effort. Here is a partially unused resource, drafts on which can stretch the productivity of all the other farm resources. Even on the more efficient farms, some scope remains for greater use of up-to-date technology.

On most farms the gap between agricultural science and agricultural practice is fairly wide. The Department and the State agricultural colleges try to narrow it through agricultural extension and other educational methods, and simultaneously to increase the fund of agricultural knowledge. Through this Department's Office of Experiment Stations, in cooperation with the State experiment stations research projects in the agricultural experiment stations have been coordinated, so as to bear directly, without unnecessary overlapping, on all vital war requirements. Results have been noteworthy already, not merely on an experimental scale but in actual farm practice, with less than the usual time lag between the discovery and the utilization of new facts and principles.

Derris and Cinchona

For example, the Federal experiment station at Mayaguez, P. R., through cooperation with the Office of Foreign Agricultural Relations and the Board of Economic Warfare, has furnished planting materials of derris for the production of rotenone in Latin American countries. Also, it has assembled and tested species of *Cinchona*, from which quinine and other drug alkaloids are produced. Approximately 10,000 cinchona plants grown on the Federal station grounds at Mayaguez have been transplanted to nursery sites. Experimental results and experience in the control of such factors as soil moisture, light, and atmospheric humidity have insured the survival of 80 to 90 percent of the transplanted trees up to the nursery stage. Study of the possibility of grafting some of the higher yielding strains of *Cinchona* to related species of the same family which are native to Puerto Rico shows promise.

Forecasts of Labor Requirements

Many experiment stations are studying various phases of the farm labor situation. An Iowa study analyzes farm labor conditions to indicate the possibilities of minimizing requirements and maximizing farm output. The Ohio station will attempt to determine the extent to which the shortage will curtail production. In Vermont an investi-

gation emphasizes the use of the time of farm women and children in relation to the farm labor shortage. The Oregon station is obtaining necessary data for forecasting the total labor requirements of the State by months, localities, enterprises, and operations. The Missouri station has undertaken a study to provide the basis for a more complete utilization of workers, power, and equipment and to learn what community effort is already accomplishing in that direction. Emphasis on the invention of labor-saving machinery has developed plans for a scraper which enables one man to do the work of two in dirt moving. Random sampling by the Georgia station has provided data on labor and power needs for crops which utilize available workers more fully.

Discoveries in Poultry Investigations

Poultry specialists estimate that the usual gather of table eggs from average flocks will probably show at least 5 percent of the eggs unmarketable because of blood spots or meat spots. When applied to the millions of table eggs produced annually, this loss takes on a broad economic significance. As to the cause, satisfactory proof has been obtained by the New Jersey station that it is not fright, as has been widely believed by poultry farmers. Evidence that heredity is an important factor has been gathered in a statistical analysis of the records of daughters of six different White Leghorn sires. The station recommends that all hatching eggs be candled before they are placed in the incubator.

Infectious coryza of fowls is responsible for some mortality directly and a great deal more indirectly through the lowered resistance of the birds to other troubles. As hens lay no eggs during the infection and for some time afterwards, the large incidence of the disease is an obstacle in obtaining eggs for the war emergency. Data derived from a study by the North Carolina station should indicate the feasibility of vaccination as a preventive and control measure. Another investigation by the North Carolina station concerns paratyphoid diseases of turkeys. The objectives are to obtain basic data on the nature and course of these infections in individual birds of all ages and to apply this information for identifying carrier birds and for control purposes. This is an extremely deadly form of disease. Morbidity from it in North Carolina has reached 66 percent, and in other sections of the country has even run up to 100 percent.

Production of Rabbit Meat

Two wartime situations are heightening the general interest in rabbit production in the United States, as reflected by inquiries to the New Jersey station. These are the high price and relative scarcity of meat and the high price of Angora rabbit wool. Anticipating such a situation, the station has been collecting information, from which it is apparent that many families might economically and efficiently produce rabbit meat in available barns, outbuildings, and sheds at low cost. This enterprise would provide them with fresh meat of high nutritive value and also help to relieve the general

scarcity of meat. With imports entirely cut off, the price for Angora rabbit wool has risen greatly. Every normal animal of this breed should be kept for wool production.

Factors in Let-Down of Milk

As an outstanding example of investigations begun as fundamental researches and developed in direct practical applications, the Minnesota station reports a study of blood precursors of milk. This work indicates rules for milking cows which should increase their production.

Following a previous report that the substance responsible for the let-down of milk is a hormone (oxytocin) secreted by the pituitary gland, carried into the blood stream, and stimulated by reflex action, the Minnesota station has now demonstrated that manipulation of the udder, such as washing and drying as preparation for milking, must be followed immediately by milking if the maximum yield is to be obtained. Handling the udder appears to stimulate the release of this hormone, and its greatest effectiveness in causing let-down of milk occurs at once and then gradually diminishes. In fact, when milking was postponed for 20 minutes the flow of milk in high-producing cows dropped 20 percent within 2 weeks. Cows should be milked rapidly, since after 7 minutes from the time of let-down the effectiveness of the hormone will have been partially worn out and incomplete milking will result. No stripping should be practiced, since cows properly milked will let down their milk completely and can be milked within 3 or 4 minutes. The report indicates that milk production can be considerably augmented in this way without corresponding changes in feed or other management.

Dairy Research Aids Production

Eleven years ago the New Jersey station embarked on a long-term breeding project aimed at developing a herd of Holsteins which would produce 4-percent milk and at the same time maintain the volume output for which the breed is famous. Ordinarily, 3.5 percent of butterfat is considered a good average for the breed. Last year the experimental herd attained 3.9-percent average. This was an achievement.

Further, the annual milk production in the herd has been increased from 8,427 to 11,973 pounds since the project was started. Total butterfat production has been raised from 307 to 466 pounds per cow, an increase of more than 50 percent.

Five years ago, under the leadership of extension specialists and county agricultural agents, New Jersey farmers pioneered in adopting a cooperative plan for the artificial insemination of cattle. The plan greatly extends the number of offspring a given bull can sire. The station herd has been used as the major source of supply for Holstein bulls. The superior germ plasm which this herd represents is being distributed to hundreds of dairy farms throughout the State. Besides increasing the output of milk and butterfat per cow, this program curbs the spread of disease, saves labor, and permits dairy-

men to lessen their occupational hazards by sending their own bulls to the butcher.

Feeding Tests With Sweetpotatoes

The Hawaiian acreage in sweetpotatoes is about six times that needed in normal times. The surplus and culls are being shredded by a machine developed by the Hawaii station as a modification of one previously designed by the Alabama station. The shredded product has been dried in one of the large pineapple bran driers, and the station is now carrying on feeding tests with it on poultry and swine. It has found that in comparatively dry locations the shredded sweetpotatoes can be dried satisfactorily out of doors.

Progress in Potato-Disease Research

Many growers who use ordinary potato seed stock are likely to have a high percentage of diseased and low-yielding plants and thus to harvest a poor crop. To aid in providing better seed, a simple flotation process which segregates the best seed potatoes out of common stock infected with virus diseases has been worked out by the Oregon station. In one test reported, the removal of the light-weight tubers eliminated approximately 92 percent of the virus diseases from the field planting.

What appears to be a new disease of potatoes, possibly of virus nature, is reported by the New Jersey station. The symptoms on affected plants are fairly conspicuous but the effect on the tubers is still unknown. Further investigations are being pushed in an effort to determine the cause, its economic significance, and possible methods of control.

Alive to the destructiveness of bacterial ring rot of potatoes, the Maine station has been conducting an important series of experiments at Aroostook Farm. It has found that disinfectants commonly used vary greatly in their ability to kill the organism on cut seed tubers, containers, machinery, and storage bins. The acid mercury dip solutions, with either hydrochloric or acetic acids, have thus far proved the most effective materials. However, the mercury disinfectants may corrode exposed metal parts of machinery. Copper sulfate has been found satisfactory for killing the bacteria on the potato bags.

Disease-Resistant Tobaccos

Two new varieties of flue-cured tobacco, one highly and the other partially resistant to black root rot disease, have been developed by plant breeders working jointly for the North Carolina station and the Department. This announcement follows more than 10 years of effort to develop a better tobacco resistant to this disease which seriously damages flue-cured crops in the Piedmont areas of Virginia and North Carolina and to a lesser extent those in eastern and southern North Carolina and South Carolina. A new project of the North Carolina station will study the seasonal development and control of

root knot nematodes, Granville (bacterial) wilt, and the fungus-induced black shank of tobacco.

New Type of Grain Sorghum

Hegari has been recognized as the most valuable grain sorghum in Texas for favorable seasons. Under poorer growing conditions, however, its grain production is sometimes much less or even almost nothing. Recently a new type, Early Hegari, more dependable in grain production and almost 10 days earlier in maturity, has been developed and distributed to farmers by the Texas station. Its earliness enables the variety to head and makes for surety of production under dry conditions, and the acreage devoted to it is increasing rapidly. Furthermore, Bonita, a hybrid of hegari, kafir, and feterita, also developed by the station and distributed in 1942, is very early, has the highest grain yield of any variety in tests over the past 7 years, and is suited to combine harvesting. Hegari has also contributed to a milo hybrid that has all the appearance of dwarf yellow milo but is resistant to the chinch bug and thrives in the northern, rolling plains area where wheat is grown and this insect pest is a menace.

Seed Treatment for Vegetables

Every State in the Union but three is now numbered among the cooperators which have teamed up to study the best methods of treating seeds of different kinds of vegetables to prevent seed decays and seedling blights, and in addition there are two Canadian cooperators. Information has been acquired that can be applied in terms of Nation-wide welfare.

It is now known definitely which common vegetable crops respond to seed treatments, what chemicals already tested are best adapted to each, and when and where treatment is most likely to pay dividends. An example of increased yields reported in these cooperative investigations is that from the New York State station where tests in 1942 indicated that 67 cents invested in treatment of peas paid as much as $30 per acre; 3 cents invested on sweet corn, $18; 25 cents on spinach, $200; and 10 cents on lima beans, $28. In the present emergency where manpower must be efficiently applied, farmers cannot afford to reseed their vegetables or cultivate poor stands of diseased plants that cannot possibly produce a full crop.

The Louisiana State University has summarized progress to date in developing a system for seed certification of beans, particularly with reference to the seed-borne bacterial blight organisms which cause frequent epidemics and severe losses each year. Seed-treatment studies having failed to give complete control, blight-free seed were procured from California, where no bacterial blight had been observed. In tests of California-grown seed over several years in Louisiana and Mississippi many fields have been observed, and at no time has bacterial blight or anthracnose been found in fields isolated from other bean-seed sources. The seed now being produced in California is grown under the supervision of the Farm Bureau and the University of California.

Economic Wastes in Milk Collection

In certain Louisiana parishes dairy farmers are making a sustained effort to reduce economic wastes reported in a study of milk concentration from farms to receiving stations. These farmers and the Office of Defense Transportation requested the Louisiana station to aid the haulers in the reorganization needed to eliminate unnecessary travel. Assistance given eliminated at least one-fourth of the distance covered.

At the request of the Office of Price Administration and the milk distributors of New Orleans, work is now under way on a plan to reduce cross-hauls and duplication of routes in the retail delivery of milk and cream. Improvements are currently taking place through cooperation with the Federal Milk Administrator and the distributors.

The Missouri and Illinois stations are cooperating in a study for the purpose of reorganizing routes in the hauling of fluid milk from farms to St. Louis distributors. Preliminary results indicate that the mileage for milk pick-up routes can be reduced by as much as 50 percent.

Vitamin-Rich Vegetables

New varieties of vegetables rich in vitamins may be added to the wartime diets of Aroostook County people as a result of tests conducted by the Maine station. Varieties tested were chosen because they mature in a short growing season and are exceptionally rich in the vitamins deficient in the diets of many Maine people. Tomatoes yielding well and ripening in August and September were sought, and two—Farthest North C and Field Station 22—were found to meet these requirements. Edible kale, high in vitamin C and carotene and rich in calcium and iron, Windsor A green sweet peppers, Savoy cabbage, broccoli, and escarole were other new vegetables that showed up well; and Early Golden I–13 sweet corn, developed by the station, matured in test gardens in the St. John Valley.

There is need for more information on the vitamin A status in northern New England. Accordingly, this station has also started an investigation of the nutritional status of selected groups of college students with respect to this vitamin. Meantime the New York Cornell station is studying the relative economy of various foods in an adequate diet in that State; and the North Carolina station has begun an investigation of the effects of curing, storing, and cooking on the carotene and vitamin C content of sweetpotatoes.

Conservation of Eggs

Important work at the Missouri station has been done on the conservation of eggs as human food. Studies already completed show that eggs with soiled or dirty shells can be cleaned so that they will keep in storage with very little loss. Other work in progress indicates that fertile eggs may be so treated that they will keep as well as infertile eggs, even at comparatively high temperatures. If this result can be successfully applied to the commercial industry millions of eggs which are now a total loss can be saved for human food.

"Fast-Malting" Procedures

The present greatly expanded program of alcohol production from cereal grains requires the use of great quantities of diastatic agents, and a probable shortage in barley malt has aroused interest not only in other agents of this class but also in "fast malting" procedures. As a corollary to previous studies of the sorghum amylases certain malting researches have been carried out by the Nebraska station, and it is now possible to produce in 2 days a sorghum malt which in some vital properties is superior to commercial barley malt. Experimentally, this malt has proved its value as a satisfactory substitute for wheat malt in flour supplementation and for barley malt in the production of industrial alcohol from grain.

Utilizing Louisiana Cut-Over Lands

Studies at the Louisiana station are helping to develop a State-wide program for the utilization of cut-over lands. This should alleviate the meat shortage by making the State more self-sufficient.

It has been shown that by applying 500 pounds of basic slag and sowing 30 pounds of lespedeza seed per acre on open cut-over areas without preliminary soil preparation, such lands can be made to provide several times their normal grazing capacity. This work led the Governor of Louisiana to call a State-wide conference for the purpose of planning better utilization of Louisiana's vast acreage of hitherto nonproductive soils. The station has distributed information widely on better pastures and feeding of dairy cattle.

A report from the Louisiana station gives valuable information on internal break-down in sweetpotatoes due to cold injury. As sweetpotatoes constitute a very important food crop in the South, any information of aid in the proper storage of them will be of value, especially when the preservation of food products is essential.

Two inexpensive sweetpotato shredders which will enable growers to better utilize jumbos and culls for feeding livestock have been developed by the Louisiana station and turned over to the extension division for introduction to farmers.

PLANT SCIENCE BUILDS FIGHTING POWER

Disease-resistant heavy-producing hybrid varieties of vegetables, fruits, grains, and other crops are proving to be important factors in enabling farmers to meet the demand for increased production of food, feed, and other materials with which to fight the war. A few examples illustrate the kind of results that are coming from laboratories, greenhouses, and test fields more rapidly now than ever before. Not only do these improved varieties supply more needed materials but they make it possible to avoid much waste of labor on poor crops.

Vicland is one of several new rust-resistant varieties now grown on a high percentage of the oat acreage in the North Central States. These varieties were developed by cereal crop specialists of the Department and the several State experiment stations. As a result, yields have been increased from 5 to 10 bushels or more an acre in non-rust years, and in bad rust years the yields are from 20 to 30 bushels more on areas seeded to the new varieties. These figures hold true in the large oat producing areas of Iowa, Indiana, Illinois, Minnesota, the Dakotas, and Wisconsin.

New Varieties Prove Merit

Thatcher wheat because of its resistance to stem rust has been the leading variety in the spring wheat region since its distribution in 1934. By 1940 it was grown in the United States and Canada on nearly 20,000,000 acres but it suffered much from leaf rust, especially in the last three years of this period. Now in the three years since 1940 it has been largely replaced in Minnesota and the eastern Dakotas, where leaf rust has been especially bad, by two new varieties, Rival and Pilot, created by the Department in cooperation with the North Dakota and other State experiment stations. In leaf rust years these two varieties yield an average of 7 to 10 bushels an acre over Thatcher, and even in non-rust years their yields will equal or slightly exceed Thatcher.

On the big cantaloup fields of California's Imperial Valley a new cantaloup called No. 5, bred by the Department and the State Agricultural Experiment Station of California and released in the fall of 1942, has taken the place of No. 45, a variety previously developed by plant breeders of these same research agencies. No. 45 was resistant to one form of mildew and was highly productive for 3 or 4 years but succumbed to another race of the disease organism. No. 5 is resistant to both races of the disease organism, and growers hurriedly produced a seed crop last fall for a planting of several thousand acres in the spring of 1943.

With the vitamin-high tomato our third most important vegetable crop, improvements in its disease resistance that build up yields are a large factor in increasing the country's vitamin intake. The Department's new tomato, Pan America, highly resistant to fusarium wilt and nailhead spot, promises to help build up yields and save labor for farmers and home gardeners. In severe greenhouse tests, Pan America recently proved nearly 100 percent resistant to fusarium wilt.

The Wando pea, announced by the Department the past year as promising for the home garden in the South and for market crops in areas where untimely freezes damage other varieties, is highly resistant to cold. Developed at the United States Vegetable Breeding Laboratory, Charleston, S. C., it resisted a cold snap that cut other varieties to the ground, losing only its blossoms, which it soon replaced. The Wando is also more tolerant of hot weather than most other varieties. It is not yet in commercial production but seed growers are increasing it.

Beans, Lettuce, and Potato Developments

The Pioneer bean, so-called because it is the first variety of snap bean resistant to curly-top disease, released by the Department and the Oregon Agricultural Experiment Station last spring to seedsmen-growers, is proving suitable in irrigated areas of Washington, Oregon, and Idaho where this disease is prevalent. It is productive, and farmers and others who have used it as a snap bean are enthusiastic about its flavor, quality, and appearance. The Logan, a so-called triple-purpose snap bean for the South, was introduced by the Department last year. It is well adapted to the market garden, the home garden, and to growing for commercial canning; is highly resistant to mosaic; and is somewhat resistant to blight. It is expected that commercial seed supplies will be built up by 1945.

Nearly all of the commercial lettuce produced in the United States today is of varieties developed by Department plant breeders in cooperation with State experiment stations. Some of the new varieties because of improved adaptability are restoring the crop to areas in the Eastern States, and making it possible to move part of the industry nearer consumption centers and to save transportation costs.

The Sebago potato, a variety created through the National Potato Breeding Program and first distributed in 1939, has increased so rapidly in popularity—because of disease resistance and other good qualities from the grower and consumer viewpoints—that 929,000 bushels of certified seed was produced last year. It is now the favorite late variety in Wisconsin, where it is highly resistant to the destructive yellow dwarf disease; is popular in Maine and New York State; and is grown on a considerable acreage in Michigan. It is being tried in various other parts of the country. The cooperative potato breeding program also brought out a new potato variety in Michigan this year that is resistant to late blight and common scab.

These few examples of new disease resistant crops could be supplemented with accounts of other promising new crop varieties valuable

because of other good characters of various kinds, including two strawberries for the Central Great Plains, three peaches for the Pacific coast, a red raspberry for the Northwest and two lima beans for the Atlantic coast.

Many Findings Meet War Needs

Many varieties of fruits and vegetables were tested to determine their suitability for preservation by dehydration and a few found best for the purpose. Among those tested were 80 varieties of peaches, 30 of sweet corn, 20 potatoes, 15 snap beans, and 15 onions.

Efforts to increase production of the much-needed protein feeds through development of wilt-resistant alfalfas brought important results this year as the culmination of several years of research work by forage crop investigators of the Department working with specialists at various State experiment stations.

One of these resistant strains, named Ranger, adapted to the Northern States, was put out to growers during the past year by the Department and the Nebraska Agricultural Experiment Station. Another recent wilt-resistant strain, called A–147, was put out by the Department and the Kansas station for large areas where the variety Kansas Common, which is not resistant to this disease, has previously been the best adapted variety. A third wilt-resistant strain is well on its way for use in the southwestern part of the country.

New varieties of alfalfa have formerly required 12 to 15 years to become established, but methods have been devised to speed up introduction. In the case of Ranger, cooperative efforts of the Alfalfa Improvement Conference, the International Crop Improvement Association, the State experiment stations, and the Department reduced this time to only 3 or 4 years. In this short time, the new strain had been increased to such an extent that 14,000 pounds of seed was available for distribution to growers. In addition to having wilt resistance, Ranger is a good forage producer and a heavy seed yielder, three characteristics never before obtained in a single variety.

Waxy Corn and Sorghum

When Japan took the Netherlands East Indies, we lost our main source of cassava (tapioca) starch. Among promising substitutes are cornstarch made from waxy corn and similar starch made from wavy sorghum. Anticipating the possible commercial use for starch from waxy corn, the Department in cooperation with the Iowa Agricultural Experiment Station began in 1936 to develop by the backcrossing method a strain of Iowa Hybrid 939, with waxy endosperm. Iowa Hybrid 939 was selected as the recurring parent because of its wide adaptation. The breeding program had reached a point in 1941 where stocks were available for increase.

Approximately 15,000 bushels of waxy corn was grown during the 1942 season in Iowa and Illinois in cooperation with the Iowa Agricultural Experiment Station. This corn was milled and the waxy starch used for commercial trials. Five hundred bushels of first-generation Waxy Iowa Hybrid 939 was harvested on the Iowa Agri-

cultural Experiment Station in 1942, yielding enough satisfactory seed to plant approximately 2,000 acres which was expected to produce corn for about 2,500,000 pounds of waxy starch in 1943.

Several waxy sorghum varieties have been grown commercially for some time, and one, Leoti Red, was utilized in the commercial production of waxy starch in 1942. This variety, however, possesses a colored seed coat which in wet milling discolors the starch. During the past 5 or 6 years the plant breeders of the Department and the Kansas and Texas Agricultural Experiment Stations have produced waxy sorghum varieties free of the objectionable pigments. These varieties are now being produced in quantity—about 20,000 acres this year.

New Cottons

Cotton breeders of the Department reported some noteworthy progress with cotton for both the Southwest and the Southeast. In the Southwest one of their new varieties, Amsak, has proved definitely superior to the present commercial variety of American Egyptian which was one of the parents in the cross. Amsak is better in breaking strength, fineness, and spinning quality. Seed is not yet available for distribution, but if field tests show that the new variety equals the yield or outyields today's favorite, commercial production is probable.

A new cotton for the Southeast, named Empire, was originated by Department plant breeders in cooperation with the Georgia Agricultural Experiment Station and is now in production. Selected from a variety called Stoneville 2 of the Mississippi Delta, it has a larger boll than the parent, is earlier, has a larger gin outturn, and when grown in the Delta or in good soil and with favorable weather in Georgia produces a 1⅛-inch staple. Under average conditions it is 1$\frac{1}{16}$ inches.

Crosses With Wild Tobaccos

Tobacco growers probably suffer more severe losses from disease than do the producers of any other major crop. In addition, diseases cause a tremendous waste of land, materials, and labor since the outlay to produce a diseased tobacco crop of low yield and quality is just as great as to produce a healthy crop of high yield and quality. One example will illustrate the indirect waste of materials caused by disease. Prior to the advent of blue mold, growers in the Southeast required from 12 to 15 million square yards of new cloth annually to cover their plant beds. Because of the loss of plants from blue mold and in the effort to make up for it they more than doubled the size of their bed areas and more than doubled the cloth and other material requirements. Control methods developed by the Department now make it possible for farmers to plant the normal area of beds.

Preliminary good results in efforts to breed tobacco varieties resistant to blue mold through use of resistant wild varieties have been reported by the Department, the first success of this kind with these highly resistant species. Progress has been slow because in the most

favorable case only one in 500 of the crosses of the wild with cultivated tobacco produced seed. But the plants from these seeds proved to be natural "tetraploids"; that is, they had all the chromosomes of both parents, which carry the inheritance of the old desirable qualities and disease resistance in addition. These look like a possible answer to this tough problem. Some crosses with different wild species have produced plants highly resistant to "wild-fire," another destructive disease.

This year flue-cured varieties resistant to black shank—one of the most destructive of all tobacco diseases—have been made available to farmers, and also varieties resistant to black root rot. In immediate prospect are new varieties resistant to bacterial wilt, a disease that has raged unchecked for more than 40 years.

Growers of cigarette tobacco are benefitting from two new varieties, No. 400 and No. 401, which were widely grown in the "flue-cured" areas the past season. These varieties are labor savers in that they make good yields with a high percentage of the leaf grades at present in greatest demand. The variety No. 400 simplifies the problem of getting large yields of cigarette leaf on the heavy flue-cured tobacco soils of the Piedmont and is resistant to black root rot. The variety No. 401 does well on the Coastal Plain and has two striking advantages. Its leaf is larger than other varieties—a characteristic that makes it possible to increase yields without increasing acreage or adding to labor costs. Furthermore, 401 can be grown without impairment of quality under more intensive methods—including, for example, the use of soybeans or peanuts in the crop rotation.

Sugar Production Improvements

War conditions forced the American sugar beet industry to become entirely independent of European seed sources, a tendency that had been well under way because of the development in this country of disease-resistant varieties. Now sugar beet production in the western United States is almost exclusively from curly-top resistant varieties bred by the Department and tested by State experiment stations, and their use has removed the threat of crop failure because of this virus disease. The leaf-spot disease areas of Michigan, Ohio, Indiana, and Wisconsin are now using two resistant new varieties developed by the Department and some of the States, which make the difference between success and failure there.

Improved varieties of sugar beets and home-grown seed, along with engineering improvements in treatment of seed, including segmenting to produce more single plants and thinning and harvesting, thanks to work of the Department and State experiment stations, are making the industry much more productive, and less dependent on stoop labor. The various improvements are encouraging many growers to stay in the business in spite of labor shortages.

A new sugarcane variety developed by the Department and State plant breeders for Louisiana and perhaps suitable for other areas has disease resistance and has straight stalks which facilitate machine harvesting. The introduction of this variety is considered especially important in these times as a means of increasing total domestic pro-

duction of sugar. Another new variety for commercial use in Louisiana is resistant to deterioration and sugar loss while stored in windrows late in the season when there is danger of damage by frost before the cane can be milled. It is also disease resistant and in this way is better than the only other important variety that has heretofore been grown extensively for windrowing.

Drug Plants

Drug-plant shortages brought on by the war have been alleviated through the quick use made of expert knowledge of these plants and methods of growing them and through Government sponsorship of production projects for rapid increase of some of them, particularly belladonna and henbane. Supplies of seed and plants of many of the kinds that produce much needed crude drugs had been maintained by the Department for a number of years, and this proved a fortunate circumstance in speeding production of high-yielding strains of good quality. Two years ago there was practically no belladonna production in the United States, but as a result of plantings in Wisconsin, Pennsylvania, Ohio, Virginia, and Tennessee, supplies for military and civilian needs are more than adequate.

The quality of the belladonna produced on the average is about twice the standard set by the U. S. Pharmacopoeia and much better than that of the pre-war importations.

In the most favorable localities per-acre yields of most of the drug plants—belladonna, henbane, digitalis, and stramonium—have been higher than anticipated. Efforts have been made to prevent overexpansion and wasted effort in regions where soil and climate are not suitable for these crops. It has been shown that some of the drug crops previously imported from Europe can be grown here at low cost and in a quality that should insure regular home production in future of all the country needs.

DAIRY RESEARCH

Developments in the production of milk and the manufacture of dairy products during the war have emphasized our dependence on scientific information. Much of the basic knowledge that dairy farmers and plant operators were able to apply so advantageously to wartime conditions was available when urgently needed, not because of a sudden new interest or increased activity in research, but because of the years of study and investigation that preceded the critical period.

The post-war period undoubtedly will bring new problems and conditions to the dairy industry, and they can be solved more satisfactorily and quickly if there is a great fund of scientific facts on which to draw. The essential information will more certainly be forthcoming if research workers, inside and outside the Government, continue their quest for new knowledge. This year's research by the Bureau of Dairy Industry has contributed some new information about old problems and also some further knowledge in newer fields.

Manufacturers of Cheddar cheese, for example, may soon be able to make cheese that will ripen in about half the time now required. Ordinarily Cheddar cheese requires at least 6 months to develop a pronounced characteristic flavor. Ripening is affected by the curing temperature and also by the kinds of bacteria used as starters. A combination of special fast-working starters and a curing temperature of 60° F., instead of 50° or lower as present methods require, promises to be a practical way of reducing the ripening period from 6 months to 3 months. Speeding up the rate of ripening would give the young cheese used for lend-lease shipment much more flavor by the time it arrives overseas, and it would also save labor and the expense of long storage and refrigeration in curing "aged" cheese for domestic consumers.

New Cheese Dehydration Method

A new method of dehydrating Cheddar cheese was devised in the Bureau's laboratories during the year, which permits the dehydration of cheese of normal fat content without preliminary processing except for granulating. The new method eliminates the need for critical spray-drying equipment, which is in great demand for other purposes. A saving in weight of about 35 percent, as compared with the original cheese, and in shipping space, of from 40 to 60 percent results when the dehydrated granules are compressed into rectangular blocks. The dehydrated cheese retains the flavor and nutritive properties of the original cheese and can be transported and stored without refrigeration if some ventilation is provided. The product apparently meets lend-lease requirements.

With the knowledge they acquired in many years of studying the causes of fat spoilage in dairy products, the Bureau's chemists this year developed procedures for improving the keeping quality of whole-milk powder and butter oil, the pure fat of milk. They established the maximum amount of dissolved and free oxygen that can be tolerated by these packaged products without deteriorating and also the amount of vacuum and the length of time it must be applied to reduce the oxygen content of the package to safe levels. This new information should make it possible to package these products so that whole-milk powder can be kept much longer than heretofore and butter oil for indefinite periods.

Riboflavin From Whey

Methods devised in the Bureau of Dairy Industry indicate that substantial quantities of riboflavin (vitamin B_2) in suitable concentration for enriching bread can be obtained from cheese whey. Liquid whey contains approximately 1.37 micrograms of riboflavin per gram and dried whey contains 22 micrograms per gram, but a concentration of about 250 micrograms per gram is needed so that 1 pound of the concentrate will be adequate to enrich 100 pounds of flour. The Bureau's research has shown that, in the manufacture of milk sugar from whey, some of the riboflavin will adsorb on some of the milk sugar, if suitable conditions or temperature and concentration of sugar and riboflavin are provided. By this method it is now possible to manufacture milk sugar containing 300 micrograms of riboflavin per gram of sugar, at approximately the cost of making milk sugar. This enriched milk sugar has been tested in bread with satisfactory results, and pilot-plant tests indicate that the method of production is practicable for large-scale operations.

Other investigators have developed a commercial process for increasing the riboflavin content of liquid whey, by bacterial action, and drying the enriched whey, which then contains 1,200 micrograms of riboflavin per gram. The product is suitable for use in poultry feeds, but its unpleasant taste makes it undesirable for use in human foods. However, from commercial samples of the enriched dried whey, the Bureau has produced milk sugar containing as much as 2,500 micrograms of riboflavin per gram of sugar. In this form, the concentrate is free of the salts that give dried whey an unpleasant taste and also dissolves readily.

Nutrition of Dairy Cattle

Numerous factors affect the efficiency of the dairy herd and the cost of milk production. Raising calves for replacement purposes is an important item of cost, particularly in times like the present when the whole milk normally fed to calves would bring a good price on the market and is also needed for human use. In long-time experiments at Beltsville, the dairy-cattle nutritionists have raised 33 heifer calves without the use of any marketable whole milk. The calves were fed the dams' colostrum milk for the first 3 days and skim milk thereafter until they were 6 months of age. In addition, they

were fed grain and hay from the time they would eat these feeds, and they were also given cod-liver oil or some other vitamin A supplement until their consumption of roughage was adequate to supply their vitamin A requirements. These calves did not grow as rapidly at first as is considered desirable, but by the time they were 6 months old their weights approximated the average of the breed. Of the 33 heifer calves raised in this manner, 21 have now gone through at least one lactation period. No deleterious effects have been noted as a result of their early feeding.

Sulfa Drugs for Mastitis

Mastitis is responsible for an annual loss in milk production, conservatively estimated at 19 million dollars. Estimates indicate that more than 85 percent of the herds in the country and anywhere from 25 to 75 percent of the cows are infected with the organisms which cause the disease. Many attempts have been made to control mastitis, with varying degrees of success, but little if any progress has been made in eliminating the disease from the dairy industry as a whole. Trials with sulfa drugs as a means of eliminating mastitis have shown promising results in the experimental dairy herds at Beltsville during the year. Forty-nine cows with mastitis infection in one or more quarters of the udders have been treated and the infection has been eliminated from 80 percent of the udders. The treatments have been administered without causing any appreciable physiological reaction or change in the udder, or any significant reduction in milk production either during treatment or immediately thereafter. The study will be continued with the use of still other drugs to determine whether the disease can be entirely eliminated from a herd and whether a herd once free can be kept free of the infection.

Findings in Endocrinology

Irregularity in breeding, or the failure of cows to conceive promptly, is another cause of economic loss in milk-producing herds. Endocrinologists in the Bureau are seeking the reasons and possible remedies by studying the relation of the various hormones of the pituitary gland and sex organs to the reproductive processes; nutritionists are studying the effect of the cow's diet on the secretion and action of these hormones. Painstaking research is gradually building up a better understanding of these relationships. It is now known that certain types of sterility are the result of deficiencies of the sex-stimulating hormones of the pituitary gland, which is located at the base of the brain; and it is also known that some plant juices contain a substance which, like the pituitary hormones, brings about sexual activity when injected into laboratory animals. It remains to be determined whether the substance in plant juices might be active when administered by mouth.

CONTROL OF INSECT PESTS

Control of insect pests and plant diseases is an important and essential part of the effort to produce and protect crops, foods, fibers, and other supplies needed by our country and its allies. War and the conditions associated with it, however, increase the difficulty of the control work. Control programs and related work carried on by the Bureau of Entomology and Plant Quarantine contribute directly to the war effort.

Many of the control activities now in use cannot be disclosed, because of the relation they have to the movement of war supplies. In fact, some recent developments of entomological research would be valuable to our enemies. Developments in the control of pests that affect the production and protection of crops, fiber, and supplies have been numerous. When the time comes to tell about them fully, the story will make an important chapter in the history of applied entomology.

Shortage of materials used in making insecticides has presented problems. The Bureau has told farmers what substitute materials will be effective and how and when they should be used. Manufacturers of insecticides have had to use many substitute materials as spreaders, adhesives, diluents, and carriers for the toxic agents. How these substitutes may modify the effectiveness of their product and how they affect the method of application, are questions that have been answered in many cases by previous research. As a part of the effort to assure that effective insecticide materials will be available, the Bureau has tested numerous new commercial combinations and intensified its research to discover new insecticides and materials which increase their effectiveness.

War Agencies Assisted

At the request of Government agencies concerned with the procurement, allocation, distribution, and control of insecticidal materials, the Bureau has prepared many reports on the usefulness of insecticidal materials and the quantities that may be needed to protect crops, food, fiber, and supplies.

Cooperative efforts directed by the Bureau made facts on the status of the boll weevil and other cotton insects available to the manufacturers and distributors of arsenical insecticides throughout the 1942 season. The information contributed materially to the control of these pests. Infestations were above the average; yet the losses caused were but little more than those of an average year. With the curtailed supply of insecticides, the yield of cotton would have been materially reduced had this information on the status of infestations not been available and efficiently used.

Programs have been continued to prevent destruction of current food and fiber crops and to assure that the progress made heretofore in this work will be maintained as well as possible. The importance of protecting essential crops from grasshoppers and Mormon crickets required some alteration in control programs previously developed. Shortages of farm labor also affected the procedure. To meet the conditions created by the war, the Congress provided funds to carry out a program designed to utilize available equipment more fully and to employ special crews under trained supervision to distribute poison bait. Thus the farmer who worked to control these pests on his own land had protection from migrating hordes from range and uncultivated lands.

Natural Forage Protected

The control of grasshoppers on special range areas of high value was a part of the cooperative effort. It saved important natural forage for cattle. In southeastern Arizona, for example, the cooperative effort saved range grasses for cattle which could not otherwise have been developed satisfactorily for slaughter. The material and labor for the control program in these areas cost only $88,232. But this expenditure saved for early marketing cattle valued at more than $235,000, or the equivalent of more than 10,000,000 pounds of greatly needed beef. Moreover, subsequent intensive surveys disclosed that the grasshopper population had been sufficiently reduced to bring the infestation there under control.

Some programs to control pests have been continued on a maintenance basis because of the shortage of labor and other conditions brought about by the war. Among them is the cooperative effort to protect small grains from stem rust through the eradication of its alternate host, the barberry. The war need for food, especially milk, has emphasized the importance of this work. The destruction of barberries in several counties of northeastern Pennsylvania in the years immediately before the war greatly reduced the stem rust of oats in that section. Farmers in the area have consequently been better able to produce feed for their dairy herds.

Barberry eradication has greatly reduced the annual loss of wheat from stem rust in the central Plains area. Initiated in a small way in 1925 and expanded in connection with the general work relief program during 1933 to 1940, the barberry eradication program has been well established as a continuing benefit.

CONSERVATION AS PRODUCTION AID

Ten years of experience in combating soil erosion and waste of rainfall have strengthened the farmer's power to meet the demands of this war.

Erosion was not understood by very many people during and immediately after World War I, and few thought of trying to control it. We had no Nation-wide conservation program, and we misused millions of acres. In fact, we indulged in probably the greatest and most costly plow-up of all time. Some 30 million acres of new land and second-growth land were plowed up. As a result, gullying was started on countless steep slopes. In the Plains the breaking out of vast stretches of grasslands resulted in a new American phenomenon—duststorms that rose at the foot of the Rocky Mountains and swept east.

Ten years ago the Government started a national soil and water conservation program, and today the picture is different. Vital farm land is not being thoughtlessly ruined this time by excessive plowing, overcropping, and other unwise use of the land. Farmers are plowing land carefully, protecting slopes, and using soil-conserving methods in all parts of the country. These conservation methods increase crop yields per acre and production per farm. Not all our cropland has been protected; but some of it has been, in nearly every community. Most farm people have learned that farming steep slopes and loose sands that shift with every breeze does not pay.

Every acre of land that can be advantageously used to produce should be brought into production. These acres must not only produce this year, but next year, and for years to come. Therefore, it is essential at this time that every single acre that we plow be planted to crops that are adapted to that particular acre and that a practical program of soil protection and water conservation be followed.

This year the Soil Conservation Service pushed a program of conservation designed to help achieve wartime production goals. It cooperated with other agencies, Federal, State, and local, with various unofficial organizations, and with individuals. Educational programs and operational activities resulted in more widespread use of soil and water conservation practices, particularly those that contribute immediately to increased production of vital war crops.

Technicians Aid Farmers

Technicians of the Soil Conservation Service assisted farmers in conserving and wisely using their soil and water resources, and also in conserving their farm machinery and their supplies of tractor fuel. Farming on the contour not only increases yields, but it is easier on machines and takes less fuel than plowing up-and-down-sloping

fields. It likewise increases farmer income and farmer interest in the permanency of the land.

More than a third of the farms of the country were in established soil conservation districts by June 30, 1943. These farms covered 512 million acres in 42 States. At that time there were altogether 886 districts, comprising 512,092,000 acres and 2,363,427 farms.

Through the soil conservation districts, individual farmers are able to obtain: (1) Technical assistance in working out practical conservation farm plans; (2) the use of equipment such as individuals do not generally own; and (3) certain materials such as seed and planting stock not generally available to individual farmers. Recently, at the suggestion of the Soil Conservation Service, most soil conservation districts have emphasized conservation practices which increase production quickly.

Reports From Representative Farms

Representative farms throughout the country have reported some of the results. Measurements have shown definitely just what conservation farming means in terms of increased per-acre yields. For example, at the Clarinda, Iowa, soil and water conservation experiment station, the average annual yield of corn on contoured land for a period of 6 years amounted to 30 bushels per acre; whereas on the same kind of land cultivated in precisely the same manner, except that the rows ran up and down hill, the same variety of corn averaged only 18 bushels an acre. This period covered some of the driest weather experienced in the locality.

A survey of 2,500 typical farms in the northern Great Plains Region (Kansas, Nebraska, North Dakota, South Dakota, Montana, and Wyoming) last year showed that contour cultivation increased the production of row crops by from 10 to 50 percent per acre. Yields of small grains increased as much as 25 percent per acre. On these same farms conservation practices had increased livestock capacity in some instances as much as 100 percent.

In the Southeastern States 1,829 typical farmers recently reported that soil conservation farming on their places had resulted in increased per-acre yields of five major regional crops—oats, wheat, peanuts, corn, and cotton—ranging from 19 to 42 percent and had increased total production of these crops substantially.

In Illinois last year, according to the Department of Agricultural Economics, University of Illinois, the per-acre yields from contoured land on typical farms in one of the most important farming sections of the State exceeded the yields from noncontoured land by 7.1 bushels of corn, 4 bushels of soybeans, 4.1 bushels of oats, 7.7 bushels of barley, and 2.8 bushels of wheat.

Assistance to Armed Forces

The Soil Conservation Service, in addition to helping farmers raise more food, fiber, fats, and oils for military uses, has given other highly important assistance to the armed forces.

Beginning in the fiscal year 1942, the Army and the Navy requested the Service to aid in planning erosion control on camp areas, airfields, hospital grounds, and other Military Establishments. This work continued during the fiscal year 1943, with erosion-control assistance from the Service in planning or establishing conservation practices on many military and naval areas, internment camps, war-industry sites, and Civil Aeronautics airfields—altogether on more than 300 sites.

Erosion on new drill fields, airplane runways, roads, streets, and other bare areas in some camps, together with the effects of flooding rainstorms and of poor drainage, was seriously interfering with military preparations. Stabilization, drainage, and other operations carried out by the Service, or done in accordance with technical methods advised by the Service, largely overcame this difficutly.

Army officials expressed their appreciation of this cooperation. In one instance dust that would have hampered operation of a synthetic rubber plant in the Western Gulf Region was allayed by vegetative protection work carried out in the program of stabilizing unfavorable land conditions in military establishments.

In some cases, useful crops were welcome byproducts of military erosion control work. For example, a thousand acres of barley planted to stop dust blowing on a California Naval Air Station Base produced 15,000 bags of harvested grain.

The Service also did a large volume of work for the military services through its Cartographic Division at Beltsville, Md.

During the fiscal year 1943, the Service looked after the needs of much of the 7,184,000 acres of federally owned land and acted as custodian for an additional 364,800 acres administered by State agencies under long-term agreements. Long-term agreements involving four projects and 26,344 acres were entered into with State agencies during the year. A considerable acreage on these lands was changed from a practically useless status to one of productive use—for example, by planting crested wheatgrass on wind-eroded, nearly bare land.

WAR USES OF LIVESTOCK RESEARCH

In the endeavor to make the swine industry still more productive, Department research workers have recently paid special attention to means of preventing losses and increasing the rate of growth. Normally many pigs die from chilling on cold nights during the early spring months when most of them are born. On the basis of tests at the Beltsville Research Center, the use of electric pig brooders can be expected to reduce death losses of young pigs about 5 percent. That was the gain in the percentage of pigs during the first critical 3 weeks before the pigs were sturdy enough to withstand moderate cold. An electric brooder can easily be made by installing a large light bulb in a frame raised about a foot off the floor in a corner of the pen; the bulb is protected by a shield of wire mesh. The gentle heat given off by the lighted bulb is a life saver for the pigs.

Department swine specialists have also studied the feeding habits and growth of young pigs. Observing that suckling pigs soon began to nibble on the grain fed to the mother sows, the specialists conceived the plan of giving the young pigs, while still suckling, a more suitable feed in the form of a protein concentrate, fed in a creep, a pen to which the sows could not gain access. Pigs fed in this manner readily acquired a good appetite for the supplementary feed and grew faster than pigs that got only their mothers' milk. They put on weight so much better that they were ready for market about 2 weeks earlier than pigs raised in the usual manner.

Still another contribution of research to swine production is a new way to save grain feed by getting hogs to eat hay. Unlike animals such as the cow and sheep, whose four stomachs enable them to use roughage to advantage, the hog has only one stomach. To learn how much hay could be fed to best advantage, the Department's investigators ground up palatable legume hay—alfalfa, lespedeza, and soybean—and offered the hay meal to pigs along with other feeds. The results of the test showed that pigs weighing about 50 pounds and fed to a weight of 225 pounds made rapid and efficient gains on the part-hay diet. Best results were obtained when the ground hay constituted from 5 to 10 percent of the total feed.

Brucellosis Vaccination Effective

Vaccination to prevent brucellosis in cattle is now well past the experimental stage and is proving satisfactory under practical farm and ranch conditions. The vaccine used is the product of previous extensive research work and carries the designation, *Brucella abortus* strain 19, the number of a laboratory culture from which it is made.

The first practical test of its effectiveness involved more than 21,000 animals over a period of six years. During this time 96.9 percent of the calvings of vaccinated cattle were normal and evidence of brucellosis infection appeared in only 1.1 percent. Since the adoption of vaccination in the cooperative plans for eliminating brucellosis in cattle on a national scale, Federal, State, and other authorized veterinarians have vaccinated more than 375,000 animals in official work. Owners of cattle have expressed themselves as well pleased with the results.

In contrast to the test-and-slaughter method that formerly was the chief means of eradicating the disease, vaccination has the advantage of preventing the disease and is thus a direct food-conservation measure. However, the test-and-slaughter method also is properly to be regarded as a contribution to the wartime food program. Eradication of the disease by the slaughter of cattle reacting to the blood test makes herds more productive. Moreover, brucellosis, although causing cattle to be uncertain breeders, does not affect the meat. Practically all cattle sent to slaughter because of their reaction to the blood test are usable as fod, is otherwise healthy.

Parasite Catalog Proves Useful

The value of having ready information for answering questions on technical and practical problems was illustrated during the year in a service involving North Africa. A lend-lease official asked the Department what material should be used for treating 2 million sheep in North Africa for mange and worms so as to make the sheep more useful for the armed forces and the civilian population.

The comprehensive index catalog of animal parasites which the Bureau of Animal Industry has developed over many years provided the information needed for answering the question. It showed that the principal parasites that affect sheep in Morocco, Algeria, and Tunisia were nodular worms, hookworms, stomach worms, tapeworms, strongyles, and liver flukes. From this knowledge and the number of sheep involved, Bureau parasitologists prescribed the proper kinds and quantities of chemicals, within 3 hours after receipt of the inquiry.

Noteworthy also is the fact that the methods and chemicals advised for freeing the sheep of parasites were the results of previous research findings. The shipment included 22 tons of phenothiazine, a drug which the Bureau investigators found a few years ago to be highly effective against several sheep parasites. Other chemicals, aggregating about 5 tons, were carbon tetrachloride, copper sulfate, and nicotine sulfate.

The index catalog lists about 100,000 parasites that plague man and animals in all parts of the world. The information is classified in several ways—geographically and by the kind of stock they affect. This index is the result of extensive methodical research and of exchanging data with scientists of foreign countries. Besides forming a basis for Federal quarantine regulations, the catalog gives promise of continued usefulness in dealing with health, food, and livestock problems on a global scale.

Livestock Parasites Yield to Treatment

By using time-tested weapons, as well as forging new ones in their research laboratories, Department parasitologists stepped up their warfare against livestock and poultry parasites. Three main weapons—all chemicals—were developed to blast the parasite enemies out of their positions by direct assault and by the slower, but no less effective, process of attrition.

Phenothiazine is the best weapon so far discovered by science for the annihilation of the stomach worm, the principal enemy of sheep the world over, and the nodular worm that robs this Nation not only of meat and wool, but also of absorbable surgical sutures made from the upper part of sheep intestines.

During the last year Department parasitologists perfected a phenothiazine-salt mixture by combining 1 part of the drug with 9 parts of common salt. When sheep are allowed free access to the medicated salt, they lose in a period of a few weeks the most dangerous parasites already present in their bodies and are protected to a large extent from acquiring new ones. This simple, inexpensive, labor-saving device is being used extensively by sheep growers to assist in the Nation's war effort and to make sheep raising less hazardous and more profitable.

Since December 1938 when phenothiazine was first proposed by Department parasitologists as a treatment for the removal of livestock parasites, this drug has become familiar to farmers, stockmen, and poultrymen all over this country and in countries allied with us in the war. Although developed primarily to combat parasites of sheep, phenothiazine is now being extensively used also to destroy parasites of horses, cattle, goats, swine, and poultry.

Factors in Meat Palatability

Department specialists have long searched for the elusive factors that make meat tender and appetizing. They have controlled the breeding and the feeding of the animals, conditions of storage, and the cooking of the meat. They have used many kinds of tests and statistical methods in appraising the influence of the different factors suspected of making the difference, for instance, between a tough dry steak and a tender juicy one.

In recent studies of meat handling at different temperatures, they found that freezing increased the tenderness of beef. To learn the preferred degree of freezing, they compared temperatures, using 20° F., −10° F. and −40° F. as well as a nonfreezing control temperature, 34° F. The low temperatures, especially −10° and −40°, gave the best results. No storage was involved in this particular study.

In another test frozen lamb rib cuts, well wrapped to prevent loss of moisture, were stored at 0° F. They proved to be of satisfactory quality after 168 days in storage, but when the cuts were held in storage 280 days there was a definite decrease in desirability. Judging from the results of these experiments, about 6 months at 0° F. is about as long as lamb rib cuts can be stored and remain palatable.

Proteins in Dehydrated Meat

No sooner had Department research shown the feasibility of dehydrating meat in a form adapted to lend-lease needs than questions about the nutritive value of such meat arose. Scientists trained in biochemistry set to work promptly on protein and digestibility studies.

Using albino rats as test animals, they laid out the experiments so that the times and temperatures approximated conditions likely to be

encountered in the use of such meats in different climates and distant places. They fed the rats samples of dehydrated pork that had been stored for 16 weeks in moistureproof containers at 0°, 70°, and 110° F. The biological value of the protein in the pork stored at 110° was only slightly lower than that of pork stored at the lower temperatures, which in turn had practically the same value as the protein in the meat before storage.

The digestibility of the protein in the samples of dehydrated pork was not affected by storage at the different temperatures. Expressed mathematically, the apparent digestive coefficient of dehydrated pork was 91.8. Additional experiments with dehydrated beef and mutton indicated the high nutritive value of the protein in these products also.

Downy Fiber From Poultry Feathers

In the present global war, much fighting is done—or is likely to be done—in cold weather, including frigid high altitudes. Military demands for equipment to be used in cold climates have exceeded the available supplies of down and similar materials ordinarily used in sleeping bags and comforts, and as warm linings for coats. Department scientists of the animal-fiber laboratory at Beltsville Research Center have studied this urgent war problem and succeeded in making a downlike material from ordinary chicken and turkey feathers.

The process, as developed by the research workers, consists in crushing the feathers and then separating the soft, lightweight downy product from the quill particles by blowing air upward through the pulverized mass. The light portions float off, leaving the quills and hard, sharp particles behind. The downy fiber thus obtained has been felted successfully with wool and other fibers. This research, the results of which have successfully met practical tests, permits the utilization of a huge quantity of feathers heretofore wasted or used for fertilizer.

Still another military use for which millions of pounds of feathers are now needed is camouflage. Light of weight and of varied colors, feathers are well adapted for many camouflage purposes. A complication in the use of poultry feathers, however, has been the fact that most chickens and turkeys are picked wet, and wet feathers spoil quickly. A practical answer had to be found to this problem. Drying small lots of feathers to prevent their deterioration is generally impracticable, especially at the small poultry-picking plants. Department scientists solved this difficulty by developing a cheap and effective method of preserving the wet feathers. The preservative prevents spoilage while the feathers are being gathered up and shipped to the processing establishments.

Among the novelties of feather research is a "pillow-punching" machine. This machine contributes to the comfort of many American soldiers. It tests and measures the resiliency of feathers placed in a small pillow. Feathers that are resilient—regaining nearly their original volume after being compressed—are especially valuable for sleeping bags, which are sometimes nested one within the other for added protection against intense cold.

CHEMISTRY IN FOOD ACHIEVEMENT

Since the war has cut off imports of many important products formerly used in this country, it has become necessary for scientists to redouble their search for substitutes to replace these commodities. During the past year the Bureau of Agricultural and Industrial Chemistry has centered its entire research program around these wartime problems. The four Regional Research Laboratories which are operated by the Bureau have been particularly active in this field. The general program of these laboratories, which is to search for industrial outlets for farm products, remains the same but emphasis has been shifted to those phases of research which have specific and immediate wartime application.

More than a thousand persons, over half of whom are highly trained chemists, physicists, engineers, and other scientists, are now employed in these laboratories. Research is under way on nearly 150 projects which are directly connected with the industrial use of of agricultural products in the war effort. These include work on rubber, industrial alcohol, smokeless powder, plastics, industrial proteins, essential drying oils, synthetic fibers, rotproofing of sandbag material, rubberless cotton fire hose, preservation of vegetables by dehydration or freezing, substitutes for cork, and for palm and other imported industrial oils, conservation of leather, and many other important projects.

Although they have been operating a comparatively short time, the laboratories have already contributed a number of worth-while wartime and perhaps peacetime developments. A brief discussion of one or two outstanding accomplishments from each will illustrate how this research is utilizing agricultural commodities as replacements and substitutes for critical war materials.

Rubber Substitute From Soybeans

The Northern Laboratory, for example, has made a rubber substitute from soybean oil. It is not suitable in its present stage of development, for automobile tires, but it can be and is being used for a great many other purposes, such as rubber heels, tubing, and gaskets, for which natural rubber was used before we entered the war. The name of this new product is Norepol, which comes from the first two letters in "Northern" and "Regional, and the first three letters in "polymerization." It was being produced commercially at the rate of about 70 tons a month at the beginning of the year, but production has fallen off because increasing amounts of soybean oil are being diverted to food purposes. Future production will be governed largely by the amount of soybean oil available for industrial purposes.

Research is being continued on Norepol so as to improve it. It can be made from any vegetable oil that contains sufficient linoleic acid. Linseed, cottonseed, and perhaps other vegetable oils may be used in the production of Norepol, and there is a valuable byproduct of meal since only the oil is used in making the rubber substitute.

New Lignin Plastic

The Northern Laboratory has also developed a new type of lignin plastic which it has named Noreplast. It can be made from farm wastes and can be used as a replacement for metal for many purposes. This new thermosetting plastic, which will harden under heat or pressure, can be made from cornstalks, wheat straw, flax shives, and other fibrous materials. Because it can be made with one-half the phenol-formaldehyde resin commonly required in the manufacture of this type of plastic, the process saves an allocated material which is badly needed for molding purposes.

This new plastic was tried in commercial plant operations and was found to mold satisfactorily in standard automatic molding machines. Bottle caps were molded during the test. It was found that this plastic is also satisfactory for an important military use, which for strategic reasons may not be revealed.

Substitute for Palm Oil

The Southern Laboratory at New Orleans recently announced the development of a substitute for imported palm oil used extensively in this country in the production of tin plate and terneplate and in the making of sheet steel by the cold reduction process. The substitute is a properly hydrogenated cottonseed oil and may create a large demand for an important agricultural raw material of the South.

This discovery has given the tin and steel industries a "tailor-made" substitute that is actually better in some respects than the original article, which was imported from the Dutch East Indies and consequently was shut off when we entered the war. Specifications for the production of this oil have been prepared and turned over to oil mills, so that we can now turn safely to the substitute even before our stocks of imported oils are exhausted if we wish to do so.

Cotton Lint in Smokeless Powder

Another contribution from the Southern Laboratory is the development of a substitute for cotton linters, used extensively in the manufacture of smokeless powder, which is needed for our big guns, antiaircraft shells, army rifles, and so on. The short, fuzzy fiber, or linter, that is removed from the seed after the cotton is ginned is particularly adapted to nitrating, which is one of the steps in the production of smokeless powder.

Under normal conditions we produce enough linters to meet our demands, but in a war like the one we are in now, we shoot up so much powder that there is danger of exhausting the supplies of some of our raw materials unless we discover substitutes. That was done in

this case. A machine was designed that would cut ordinary lint cotton, since there is no commercial machine which will do the job. Normally lint cotton is too expensive to use in making powder. Plans for a machine which in a short time can cut enormous quantities of cotton into very short pieces similar to linters were drawn up and such a machine is now under construction.

Wax From Sugarcane: Alcohol Distillation

Out of the sugarcane "mud" that results during the process of milling cane, the chemists see the possibility of recovering annually some six or seven million pounds of wax useful in industry and to the householder. Coming at a time when additional domestic sources of such material are especially desirable, due to import difficulties, this discovery is considered valuable to defense.

The wax occurs as a thin coating on the surface of the cane stalks. The coating is so thin that a ton of cane yields less than 2 pounds of wax, and recovery would not be economically feasible if it were not concentrated, in the course of manufacture of sugar. Samples sent to the trade indicate there will be a good demand for the product whenever it is produced in quantity. It can be used in the manufacture of polishes, impregnated and coated products, and moulded articles and also to replace waxes now difficult to get because of unsettled world conditions.

Results of recent research in the Bureau may make it possible to produce industrial alcohol from wheat with a much smaller amount of malt. Scientists have found that the diastase in granular wheat flour can be activated so as to convert its own starch into fermentable sugars without the addition of malt, which always heretofore has had to be used when alcohol was made from grain.

This new discovery was developed in the laboratory and then tested on a large scale in a beverage distillery now producing industrial alcohol. The discovery of this process comes at a time when distillers are turning more to wheat for producing their industrial alcohol, so that corn, the grain customarily used for that purpose in normal times, may be used in the feeding of livestock.

An important observation during the development of this new process indicates the possibility of separating the protein and the starch at the beginning of the alcohol process. If this can be achieved industrially without too much expense, a large amount of protein for livestock feed may be made available before distillation, instead of being recovered from distillers' slop as at present. Possibly some of this protein might even find uses as human food.

The Office of Production Research and Development of the War Production Board has arranged to carry out tests on a commercial scale to evaluate this new process from the standpoint of both alcohol production and protein-feed recovery.

The New Drug Penicillin

One of the wartime developments which will undoubtedly survive to help civilians when the world is at peace again is the production of the powerful new drug penicillin. This new germ killer is being

used successfully by our armed forces in the treatment of infected wounds and certain infectious diseases. It is produced by a mold similar to one that grows on certain kinds of cheese. Scientists in the Bureau's Peoria, Ill., laboratory are playing an important part in expanding the production of this new product. The phenomenal success of penicillin in the treatment of some of our most dangerous infections and diseases leads medical authorities to believe that it will be as important in its field as the sulfa drugs are in theirs.

Very little was heard of penicillin, which was discovered by a British scientist in 1929, until the summer of 1941, when two British scientists came to this country to stimulate interest in the pilot-plant producion of the new product. These men were sent to the Peoria laboratory because it had had wide experience in the use of molds in the fermentation field and because it had one of the largest collections of molds in the world.

By proper feeding of the molds and by improving the strains of molds that produce penicillin, the laboratory workers were able to increase the yield a hundredfold. But even with the increased yield worked out in the Peoria laboratory, the output of penicillin is still far short of the demand.

The reason penicillin cannot be produced in large quantities like the sulfa drugs is that it has to be grown, and as yet we do not know its chemical structure. The mold that produces penicillin must be grown in pure culture. This makes it necessary to grow the mold in small units carefully protected from other organisms. In commercial practice this is difficult.

But this is the sort of problem which the four Regional Research Laboratories are prepared to solve. Their pilot-plant facilities enable them to take research beyond the test-tube stage and into semicommercial production. Penicillin, promising as it is today, was not produced in sufficient quantities to make it of any great importance until research in the Peoria laboratory found a way to increase the yield so that it was possible for industry to go ahead on a semicommercial scale.

DEHYDRATION OF FOOD

Dehydration—rapid artificial drying—of foods has wartime advantages recognized in this country at least as long ago as the Civil War. Removal of most of the water from food materials effects a reduction in volume and weight that saves one-half to five-sixths of the shipping space required, depending on the product. Moreover, food dehydrated in accordance with the latest findings of research loses little of its color, flavor, and texture; if properly packaged it keeps for long periods without refrigeration; and it can be readily restored (reconstituted, or rehydrated) to approximately its fresh condition by the addition of water.

In 1918 nearly 9 million pounds of dehydrated food—mostly potatoes and soup mixtures—shipped to our armies in Europe was largely wasted, though some of it was good. In that year the Department of Agriculture began research to develop methods of dehydration that would produce uniformly better products. It was found that an important step in preparing vegetables for dehydration was blanching—scalding or steaming—for a short period, the optimum length of which differed for each individual product. Drying time and temperature, too, must be carefully controlled and suited to that commodity.

When the country was faced with another war, the Department in 1941 renewed its study of the problems of dehydration. One of the two large wings of the Western Regional Research Laboratory at Albany, Calif., was used as a pilot plant and vegetables were dehydrated there on a semicommercial scale. The most important types of dehydrators—tunnel, cabinet, and vacuum—were installed and tested. In the fall of 1942 results warranted the holding of two "dehydration schools," one in the West and the other in the East. At these 2-week sessions scientific workers of the Department and other agencies shared the knowledge they had acquired in the laboratory and pilot plant with commercial dehydrators, who contributed the practical findings of experience.

Some Loss of Vitamins

Caloric and mineral values are retained almost completely in dehydrated vegetables and fruits, but there is a loss of vitamins. Research in this field is being carried on with emphasis on finding methods of processing by which the maximum amounts of vitamins will be saved.

Meat hydration, research work on which was started at the Beltsville Research Center early in 1942 with the cooperation of several outside agencies, has progressed to the stage of mass production for war needs. The vacuum-rotary method, which is simple and rapid

and preserves wholesomeness, nutritive values, palatability, and keeping quality of meat, was developed.

A development that effects an additional saving in shipping space of 25 to 80 percent is compression of dehydrated foods. Dehydration removes most of the water from food materials; compression squeezes out the air. The kind of product and the pressure applied—from a light pressing or shaking down to 2,500 pounds per square inch—determine the reduction in volume. The degree of compression used must be compatible with satisfactory reconstitution.

A comparison of the volume of fresh, dehydrated, and compressed dehydrated food is furnished by carrots. Fresh carrots weighing 510 pounds occupy 11.5 cubic feet; dehydrated, the carrots weigh 51 pounds and fill 2.9 cubic feet; the same 51 pounds of carrots when compressed occupy 1 cubic foot. Blocks of compressed food can be packaged and handled easily, and shipments of compressed dehydrated vegetables, eggs, and milk are rapidly increasing.

MARKETING UNDER WAR'S IMPACT

The war has had many temporary and some lasting effects on agricultural marketing in the United States. Some of these effects represent tendencies apparent before the war began, such as the lessening of overlapping and extravagant services in retailing, and improvements based on recent discoveries in food processing. Other effects of the war on agricultural marketing come from our current food and labor shortages, with attendant rationing and price control. Although many of these effects will disappear after the war, when most of the controls are removed, some of the wartime programs will be useful under peacetime conditions, especially during the demobilization period if we undertake to relieve want extensively in famine-stricken countries.

Moreover, associated with the adjustment of marketing to shortages, both of foods and of means of producing foods, are certain gains in marketing efficiency, developed through the efforts of processors and distributors to cope with price squeezes and other difficult conditions. Gains of this type, it is to be hoped, will carry over into the post-war period. Our marketing system may be in closer adjustment than our production system to long-time requirements when the fighting stops.

The war affected agricultural production vitally in the United States sooner than it did marketing. After we became embroiled ourselves, however, the developments in marketing were rapid, especially with the advent of price ceilings in the spring of 1942. These developments soon affected all branches of the distributing machinery. Principally the changes arose from two main causes: (1) The need to divert ever-increasing quantities of foods and other agricultural materials from civilian to military uses; and (2) shortages of labor, transportation, equipment, and materials, which affected agricultural processing and marketing equally with agricultural production. The need to allocate supplies and prevent inflation, and the equal need to economize labor, materials, and facilities, pressed the marketing system from two sides. It had constantly a bigger and bigger job to do, with no proportionate increase in the means of doing it.

Multitudinous New Problems

Each day brought a new crop of developments, the details of which sometimes pushed war news off the front page. Multitudinous new problems arose in the handling of supplies, prices, margins, transportation equipment, and materials. Necessarily, the effects on different commodities and different marketing agencies varied tremendously. Even now, with the wartime pattern of change quite far along, the developments lack consistency; hence few broad generalizations about them can be drawn.

Everyone recognizes the main impact of the war on agricultural marketing; namely, its transformation of abundance into shortage. On the one hand, we must go deep into the food pile for military and lend-lease supplies; and on the other, we must withdraw manpower and machinery from agricultural production and marketing so as to maintain other war activities. Marketing agencies as well as farmers must accomplish more and more with less and less. They can do so only within a framework of governmental regulations.

In 1942, with food production about 11 percent greater than in 1941 and about 27 percent above the average for 1935–39, the supply available for domestic civilian consumption was slightly less on a per capita basis than in the previous year, although about 10 percent above the average for the period 1935–39. The situation has been similar this year, and attempts to deal with it have involved extensive price controls and rationing, with tremendous repercussions on every part of our marketing system. Since we cannot provide fully adequate supplies for military, lend-lease, and civilians, we have to allocate the supplies we have, through what amounts to Government control of the distribution of these supplies.

Some "Shortages" Unreal

Some "shortages" in 1932 were only apparent, rather than actual, but nevertheless added to the need for regulated distribution. Meat production, for example, was considerably greater than in 1941 or than during the pre-war period 1935–39; it topped 22 billion pounds, as compared with the 1935–39 average of about 16 billion. After military and lend-lease requisitions had been met, consumers had left about 17.8 billion pounds of meat in 1942, as compared with an average consumption of 16.3 billion pounds in the period 1935–39. Civilians as a group had more and not less meat than usual.

The appearance of a shortage was the result chiefly of an unusual relationship between consumer buying power and the supplies available. People had much more money to spend. Consumer incomes ran 70 percent greater than the average for 1935–39 and raised the potential demand for meats far above the offerings. In some localities the shortage was real, because uneven price ceilings or other conditions prevented them from receiving their proportionate share of the total supplies available. Generally, however, the situation meant simply that consumers could not buy as much as they wanted to buy. It affected marketing just the same.

Changed Forms of Marketing

Besides increasing the volume of food marketings, the war changes them in form. Military and lend-lease requirements bring new demands for certain products, such as dehydrated foods which require little space and can be shipped without refrigeration. This development may have important consequences when the war is over. Consumers in Great Britain are said to have accustomed themselves quickly to some of these unusual forms of processed foods, and our soldiers abroad are doing likewise. The frozen-food industry also has been

stimulated in some respects by the war, and no doubt will develop rapidly when new equipment becomes available after peace.

Ultimately the use of dehydrated and frozen products may greatly alter the marketing of eggs, milk, fruits and vegetables, and possibly of meat also. This will affect cold storage, canning, produce marketing, and retail distribution. Much will depend, of course, on relative costs, about which we know little as yet because cost is not important in filling wartime needs for specially processed commodities. The war is also creating new demands for soybean and peanut flour and for canned and dried whole soybeans. These products have unusual food values, especially as a partial substitute for meat; they may prove to have extensive peacetime uses.

For some time after Pearl Harbor it was feared that the limited stock pile and imports of tin would not be sufficient to last through the war, and that extensive shifts would be necessary in methods of processing foods formerly packed in cans. But the quantity of tin cans to be made available for packing fruits and vegetables in 1943 will suffice for all or nearly all the raw materials available, and exhaustion of tin supplies is not now in sight, due to vigorous efforts to increase imports from South America and Africa and to effective tin-conservation measures.

Influence of Ceilings and Rationing

Pleas and protests from the food trade show that price ceilings and rationing are among the wartime marketing features that give the most trouble. They radically alter many competitive factors in food marketing. In ordinary times prices act as the automatic governor of food distribution. Price controls necessarily make prices inflexible and out of line with supply and demand conditions. This leads to all kinds of maladjustments in distribution.

Following the imposition of ceilings on pork prices in March 1942, for example, prices could not rise to bring the usual adjustment of consumption to available supplies. Moreover, the regulation gave higher ceilings to some localities than to others and allowed some packers and retailers an advantage. It encouraged the sale of meat direct by packers to retailers, with the result that shortages developed in some territories formerly served largely by wholesalers.

The demands of retailers, particularly in the East, for sufficient meat to supply their customers caused packers to bid eagerly for hogs. In consequence the margin between the price of live hogs and the wholesale value of hog products narrowed greatly, and the squeeze led to loud protests from packers. Some packers had more favorable ceilings to operate under than others, and consequently, an opportunity to squeeze their competitors. Despite extensive adjustments of the original price ceilings, complaints continued to pour in, and a satisfactory solution of the problem always seemed to be well around the corner.

The demand of some trade interests for price ceilings on live hogs finally led to their establishment in the fall of 1943, but gave rise to still other problems such as quality differentials. Similar difficulties

and maladjustments appeared in connection with many other food products.

Wartime Trading in Futures

Questions arose as to the necessity of trading in futures under wartime conditions. Ceiling prices and support prices tended greatly to reduce the price fluctuations on which speculation depends, and which justify the existence of risk-taking agencies. The general demand situation likewise operated to reduce price variations. These conditions caused trading on the futures exchanges to decline often below the volume necessary for profitable operations. Also, the public interest was less clearly served by futures trading than in normal times. Studies indicated, however, that the price ceilings and price supports did not wholly eliminate price risks, and that these continued to be sufficient to warrant some use of the futures markets for hedging purposes.

Many people believed, before general price controls came into force, that trading in futures markets was contributing to the rise of commodity prices, and that the futures markets were definitely an inflationary element. Speculation in soybeans aroused criticism for a time. Under the Government price controls, however, the inflationary potentialities of futures trading dropped sharply, along with the need for risk shifting. Attention turned then to the future of futures trading.

Experience with price supports and other price controls led to suggestions that more reliance should be placed on similar measures in peacetime, possibly in connection with some system of "forward pricing." Producers could have some advance assurance of minimum prices to be received. This would help to reduce the risks involved in production and might tend to bring about a better balanced production of crops and livestock.

Any such projection of price controls into the post-war period would affect the futures markets vitally. Even if the peace brings a return to pre-war trading methods, the futures markets will probably feel the effects of the wartime experience for many years.

Condition of Retail Trade

Mainly noticeable to the public was the effect of the war controls on retailing. Ordinary observation, however, led many people to wrong conclusions. For example, there was a general impression for a time that the volume of retail food business declined in 1942. Actually it increased by about 25 percent in dollars over 1941 and by possibly 5 percent in physical volume. Food retailers had their margins squeezed severely by the general maximum price regulation of April 28, 1942; but the effect on store profits was less than some of the complaints might indicate. On uncontrolled items some margins rose. Another compensating factor was a general increase in store trade, with a resultant decrease in overhead unit costs. Most food retailers found 1942 a profitable year.

Retail food stores declined slightly in number during 1942, but the decline was apparently not the result of financial failures. As reported by Dun's Review, the number of stores removed from the list in July and August of 1942 was slightly less than in the corresponding months of 1941. On the other hand, the number of new stores added was considerably less. These trends continued into 1943. Some observers had predicted heavy mortality among food stores. There is little evidence as yet to justify that forecast, though the number of stores will probably decline to some extent as rationing and labor shortages increase.

The number of new stores established during the war is held down by other opportunities for getting a living. Apparently the competitive position of the chains has deteriorated from various causes, such as ceilings that handicapped their bidding for new supplies, and the dependence of their supermarkets on the customers automobile.

Problem of Marketing Services

Supermarkets have lost ground in the suburban districts. More people use the neighborhood stores, to save tires and gasoline; sometimes, too, the neighborhood stores with their relatively higher price ceilings can stock goods unavailable in the larger markets. On the other hand, the independent stores that provide delivery services suffer from shortages of tires, repair parts, and labor. The chains, which have a larger proportion of supermarkets than the independents, appear to be emphasizing medium-sized supermarkets rather than very large ones, and at the same time to be sharply reducing the total number of their outlets. This is a hastening of tendencies previously observed in the reorganization of chain-store systems, some of which have reduced tremendously the number of their stores.

Some elimination of marketing services has taken place, as a result partly of wartime shortages of labor, tires, gasoline, and delivery equipment, and partly from the squeeze on margins produced by the maintenance of retail ceilings in the face of higher prices to producers. The pressure on distributors to reduce their costs has forced elimination of some services. In the bread-making industry, for example, it has appeared that a rise in flour prices, authorized to keep flour mills running under higher prices for wheat, could be absorbed by economies in distribution. Extravagant marketing practices have been common in the marketing of bread; they have included fancy wrappings, numerous brands and types of loaves, frequent deliveries, and the return of stale loaves. Consumers have accepted reductions in these services with no particular evidence of dissatisfaction. The economies have helped to offset increased costs at other points.

Possible Economies in Distribution

Similar factors have brought economies in milk distribution in some markets, such as the replacement of daily deliveries with deliveries every second day. These savings, have sometimes been more important in a physical sense than in dollars; they have conserved

tires, gasoline, equipment, and labor, with advantage to the country, but without much reduction in distributors' costs. Milk distributors gain little, for example, from the reduction of delivery services if they pay their drivers on an unchanged commission basis. Some of the savings achieved in distributing milk and bread, and in other branches of retail distribution, may continue to some extent when the war is over. Consumers may decide that the eliminated services were not essential or even desirable.

Shortages of trucking equipment, gasoline, and labor compel attention to some existing faults in the marketing system. Conditions in the Southeastern States, particularly in connection with the marketing of dairy and poultry products and vegetables, provide an example. Much of the production in this area is scattered among small growers, whose individual output has warranted only rudimentary marketing facilities. Truckers roam the countryside and pick up small lots of produce. They may take their loads north to terminal markets or take them to southern assembly points. However, these southern assembly points often do not have rail facilities, and do not handle a sufficient volume of produce to attract many buyers. In consequence the truckers have to go from point to point to sell their loads. Such haphazard methods place too great a premium on the bargaining skill of both the individual growers and of the itinerant truckers and are the cause of much dissatisfaction. Federal and State agencies are looking into the problem.

Serious before the war, the difficulty is extreme under war conditions because the transport shortage steadily reduces the number of itinerant truckers. Specialists who have studied the problem believe it would be possible to establish market centers, at points chosen with an eye both to the volume of produce obtainable and to shipping facilities. Farmers could pool their trucking to these points, where services would be available for sales to distant markets. Among these services, if the project developed, would be official grading and market news, and perhaps Government purchasing operations. These proposals, though still only tentative, have aroused keen interest. They may result in the development of new facilities, which will remain as a betterment when the war comes to an end.

Official Grades and Grading

The war has tremendously stimulated the use of standard grades and of official Government grading services. Purchasing for military and lend-lease use depends largely on Government grades; it provides an incentive for firms to use them in order to become eligible as Government suppliers. Prices for pork, beef, and lamb are based on Government meat grades; this expands meat grading.

Government purchasing also promotes Federal inspection of meat-packing establishments, since the Government does not buy from uninspected plants. Ceiling enforcement expands the scope of canned-goods grading. These developments accustom both dealers and consumers to Government standardization, grading, and inspection, and promise to carry over into the post-war years. They may foster

efforts to link the grades more closely with consumer preferences, so that less excuse will remain for the prevailing multiplicity of unstandardized quality designations used by the trade.

Quality ranges in pricing tend to become narrower under war conditions. This follows from the shortages of many food items that are under ceilings. With consumers thankful to get almost any quality, and willing to pay up to the ceiling prices for the lower grades, the narrowing of price differentials is natural. Official use of grades in connection with price ceilings provides only a partial offset. People become acquainted, however, with products and qualities which normally they would not use, and sometimes discover that sellers' claims cannot be justified.

It may be less easy hereafter to maintain some quality price differentials. What effect this will have on quality production we cannot tell; but the disappearance of merely artificial or unreal quality-price differentials need not be regretted. In any event the problem will be important to many marketing agencies, including cooperatives that have worked hard and long to build up quality reputations.

Costs of Marketing Not Up Greatly

Factors usually associated with increases in marketing margins, such as scarcity of labor and equipment, rising wage levels, and other additions to operating expenses, recently have been more stable. Despite the pressure of these factors, the total costs of marketing a given quantity of food products have not increased greatly during the war. By July 1943, they were only 7 percent above those of 1941, the year in which they were the lowest since the depression year 1933, and about the same as the average for the period 1935–39.

From 1935–39 through July 1943, the full dollar increase in food costs to consumers had been passed back to the farmer. In the marketing of cotton products the situation was somewhat different. Marketing charges in cotton have risen above the 1935–39 level, in approximately the normal relation to prices, wage rates, and the other factors usually linked with changes in margins. Yet cotton farmers in mid-1943 were still getting about 13 cents of the consumer's dollar, the same as in 1942, as compared with 12 cents in 1941 and an average of 9.3 cents for the period 1935–39.

So far the spread between farm prices and retail prices for food products has been remarkably stable during the war. This reflects the influence of price ceilings, which have prevented many advances at retail which otherwise would have occurred but have not prevented the prices of many farm commodities from rising sharply. As previously noted, marketing agencies have had an increase in the volume of their business, and have been able simultaneously to increase their operating efficiency. Consequently they have found it possible to withstand the squeeze. Apparently, however, the squeeze narrowed the margins of many agencies to an extent that they would not be capable of bearing indefinitely, as recent OPA decisions have recognized. These decisions have permitted increases of certain prices. Some elements of the food industry may be in need of relief eventually.

Marketing Facilities Abroad

The war is directly responsible for another very important development which will affect the international marketing of farm products; namely, the formation of an international agricultural organization to foster "freedom from want" the world over. This organization, formed as a result of the United Nations Conference on Food and Agriculture at Hot Springs, Va., in May 1943, will promote expanded production and distribution of food so that peoples everywhere will have enough to eat, a condition which in the past is said to have applied to only about one-third of the world's population. Naturally, this will call for much revamping and improvement of marketing facilities in many countries and in the machinery for carrying on trade in foodstuffs among nations.

The Conference recommended action by the international organization to provide, if practicable, international grading, market news, and other services similar to the governmental services of like nature which have been found so useful to farmers and marketing agencies in the United States and some other countries. It urged individual governments to recognize their responsibility for providing such services nationally. In addition, it pointed to the necessity for governments sponsoring vital improvements in marketing facilities and methods necessary if the people in many areas, especially those of low industrial development, are to be reached with adequate quantities of healthful foods. It urged that governments engage to a far greater extent in marketing research and education necessary to bring about these desirable ends.

FARM STATISTICS IN WARTIME

Crop and livestock information of the magnitude now considered essential was not available during World War I. Then, as now, the Department had the problem of advising the farmer in his efforts to meet wartime needs for agricultural products, but information was lacking concerning many important items. The record of acreage and production of grain and cotton, tobacco, and potatoes was reasonably sufficient. The war brought inauguration of a statistical service on fruits and vegetables, but there was a demand for information about livestock production which was not met until after the war. The record of federally inspected slaughter had its inception at the turn of the century, but this told the story only of past marketings and provided no clue to what might be expected in the future.

This demonstrated need pointed the way to a more adequate statistical service on these commodities. During the 1920's, information was developed concerning production, probable production, marketings, slaughter and consumption of meat animals. Notable among these developments were the pig reports on farmers' intentions to breed. Begun in 1923, these semi-annual forecasts of hog production are now taken for granted as authentic indicators of forthcoming hog supplies. During the late 1920's and early 1930's, a similar background was developed concerning chicken and egg production, milk production, and the manufacture of dairy products. These filled in blank pages in agricultural statistics because for these commodities no record similar to the record of slaughter under Federal inspection was available.

Peacetime Uses of Data

In peacetime the public—farmer, merchant, consumer—is the most important user of agricultural statistics. Individuals buy and sell their products, raw or processed, in a relatively unrestricted market on the basis of all information available. For farm products, the estimates and forecasts of crop and livestock production are among those most commonly used. Economists in the Department and in the agricultural colleges also use the statistics of production and prices in their analyses, and advise the farmer and the public of the economic importance of the facts available. In the war years the action agencies of the Department make vastly increased use of such data in working out, adjusting, and administering their programs.

It was the hope of the Department in the period between the wars that statistical crop information would enable farmers to minimize alternate periods of oversupply and undersupply with their concurrent evil of drastic price changes. In formulating the action programs in line with these policies, it was necessary to develop comprehensive series of information on the supply and distribution of

agricultural products. Much information of this character had already been developed in connection with the Outlook program of the Department, a work begun in the early 1920's as an informational service to advise farmers of what might be expected in the way of prices under given conditions of supply. In the action programs, however, it was essential to have greater precision in the statistics of agriculture and to take cognizance of all factors bearing upon supply and price and also on conservation of the soil.

Wartime Applications

In the war economy the need for precision is still greater as the basis for governmental controls in many phases of the Nation's economy. The public continues to use the data; individuals formulate bases for action in the market as before; but their freedom of action is restricted. The economists of the Department and the agricultural colleges have new and vitally important uses for crop and market facts. Administrators of the action agencies must have extremely accurate and refined data if they are to do their job well. They can't take long chances, when allocating supplies, that the allocations will come out fairly even with the supply. If they have to stimulate the production of a commodity, they must know definitely what the present level of production is.

The mass of information which had been developed enabled the Department to enter into its World War II programs with a reasonably precise picture of agricultural plant capacity and its production possibilities. While far from perfect, the statistics served to direct the allocation of food and other agricultural products to civilian, armed forces, and lend-lease needs. Facts of agricultural supply needed to be known, however, in greater detail than before, and also with the greatest possible promptness. There was danger that time lost in gathering facts would mean time lost in crop planting. If a shortage of any food existed, it was important to know in time for action to refill the bins and barrels. If there was a surplus, it was important to develop waste-prevention measures. By and large, the statistical services of the Department measured up to the need; they provided the type of information required to guide both production and consumption in the war emergency.

Scope of Crop Reporting

Measures of crop supplies and probable supplies are available at all times. As early as March, the prospective plantings reports register farmers' plans for crop production while there is still time to modify them in the light of prospective needs. During the growing season the ever-changing picture is reviewed monthly. Each forecast registers the change in probable production. For the major grain crops—wheat, corn, and oats—quarterly reports of stocks, used in conjunction with the monthly forecasts of production, constitute a running inventory of supplies on hand and in the making. For other grain crops, semiannual reports of stocks have been available.

For soybeans, that new wartime crop of first magnitude because it is an oilseed, an information service comparable with that for corn, wheat, and oats has been established since the beginning of World War II. That other oilseed, peanuts, which has been diverted to the crushing industry in increasing amounts in recent years, has been the subject of monthly reports for a period of 5 years. Information collected on this crop by the Department is in sufficient detail to indicate at all times the quantity of raw materials and finished products available.

The Army needs beans, which are a food crop in highly concentrated form; but there are many kinds of beans, from small white navy to large lima and the multicolored pinto varieties. Each of these has its role to play in providing food for the armed services, for civilian use, and for export to our allies. The changing picture of production of beans by kinds is reported in the agricultural statistics of the last two decades. To maintain a closer control of distribution, quarterly reports of stocks by kinds have been available since the beginning of World War II and will be kept available for the duration.

Cotton, Grains, and Hay

Cotton has an important role to play in war also. Special need exists for increased quantities of the longer staple lengths. Grade and staple estimates, developed during the last 15 years, record the production of the various cottons, and show the quantities available in the stock pile. The monthly forecasts of the Crop Reporting Board show separately the probable production of American-Egyptian long-staple cotton.

Corn, oats, barley, sorghums, and hay are grown on 230,000,000 acres out of the 350,000,000 acres of land devoted to crops in the United States. These are the main feed crops. Supplies of the feed grains are closely watched in relation to the livestock numbers, since the outturn of feed determines the long-run outturn of pork, beef, veal, lamb, mutton, chickens, turkeys, eggs, and milk. Feed crop production and livestock production must be kept in balance; the statistics of feed-crop production help farmers to do so. Monthly crop reports, used in conjunction with the quarterly reports on stocks of corn and oats and semiannual reports on stocks of barley, sorghums, and hay, provide the basis for frequent reviews of the feed-livestock situation, and consequently for necessary changes in production plans.

Livestock Statistics

In the field of livestock statistics, the Department issues annual livestock inventories, semiannual pig-crop estimates, and annual estimates of the calf crop and lamb crop. They show prospective as well as current production. Monthly reports of poultry and egg production indicate how much chicken we shall eat and how many eggs we shall have. The statistics of liquid, frozen, and dried egg production have a special wartime significance, because eggs in the dried form

have become an important part of the diet of our armed forces. For milk, the most important single United States agricultural product, the monthly estimates of production register the forthcoming production of butter, cheese, canned milk, and whole milk for fresh consumption. They guide the War Food Administrator in deciding upon price supports. Monthly reports of manufactured dairy products complete the picture.

New phenomena with respect to the relationship of supply and price have developed with the advent of rationing and price ceilings. Many problems with regard to the just and fair distribution of agricultural products still remain to be solved; but the hope of solving them is much greater than it would be if we did not have accurate and comprehensive crop statistics. Much fumbling and trial-and-error seeking, such as we had during World War I, would be unavoidable.

Sources of the Statistics

The statistics of agriculture come from many sources. Some are records of regulatory and inspection services of the Department; some are assembled from reports of other Federal agencies or State governments; many are estimates based upon inquiries sent to farmers, dealers, and processors. The greatest source of information is the farmer himself. The principal medium is the mailed inquiry.

Estimates of acreage and of livestock numbers are based upon samples of individual farms, obtained in varying numbers at various times of the year. The most extensive are the rural-carrier samples of livestock numbers in June and December and of acreage harvested in October. Each rural mail carrier is given 10 to 20 cards to distribute to farmers on his route. In areas where farmers are not served by rural carriers, the distribution is supplemented by direct mailings. The farmer is asked to fill out the card for his own farm and return the card to the rural carrier.

The next in size is the list of a quarter-million farmers to whom are mailed similar cards relating to their intentions-to-plant as of March 1, and relating to actual plantings as of mid-June. These inquiries are the basis of the Prospective Plantings Report and the July estimates of acreage for harvest. The latter serve as the acreage base for the season's forecasts of crop production. More extensive in total numbers, but limited to 32 States, are the assessor's totals of livestock assessed for taxation, and, limited to 13 States, the assessors' enumerations of crop acreage. For certain crops, as for cotton, wheat, and for corn in the commercial corn area, extensive data are also available from the Agricultural Adjustment Administration records.

Eighty Thousand Regular Crop Reporters

Important in the forecasting of crop production and in measuring milk and egg production are the 80,000 regular crop reporters who receive a general crop and livestock inquiry each month. In addition there are dozens of lists of special reporters that furnish information on a multitude of subjects.

Personal interview by full-time employees relating to specialized crops such as vegetable crops grown in concentrated areas for shipment by truck and refrigerated car are still relied upon, but this approach is necessarily on a restricted scale during wartime. Telephone and telegraph have to a considerable extent replaced intensive personal surveys.

Thousands of dealers in the country market places report upon prices paid to farmers for agricultural commodities and prices paid by farmers for the things they buy. Processors of crops and livestock products render monthly or annual reports of the quantities of raw products purchased and of finished or semifinished products obtained.

The voluntary cooperation of these thousands of public-spirited citizens has made it possible for the Department to be informed of developments on all parts of the food front. It has enabled the Department to pass this information back to the public as a basis of action of farmer, dealer, and consumer, and has guided administrators of the action agencies in their task of directing the combined efforts of American agriculture in the path of victory.

CROP INSURANCE

Upon passage of the Federal Crop Insurance Act by Congress in February 1938 the Department inaugurated a program of crop insurance for wheat. In June 1941 by action of Congress, cotton was added to the venture. The 1944 Agricultural appropriation bill passed in July 1943, withdrew financial support for continuing the program and provided only sufficient funds for completing insurance on the 1943 crops. The arguments advanced for such action were that the participation in the program was too small and the expenses too large to justify its continuance. It seems advisable, therefore, to review the program that has been in operation.

Participation in the insurance program was voluntary rather than compulsory. Insurance was of production only; not insurance of income which would involve also a price guarantee. To accomplish this the plan was one of insurance "in kind"; i. e., premiums and indemnities were to be determined "in kind" even though they might be paid in the cash equivalent to the commodity insured. The Government, by annual appropriation, was to take care of the cost of administration while the insured farmer was to bear the cost of the indemnities for crop losses. The plan was one of individual-farm rating whereby the insurance coverage and premium rate for each farm would be commensurate with its productivity and risk of loss.

After 3 years of insurance of wheat, cotton insurance was added, the first crop insured being the 1942 crop. The cotton insurance plan was very similar to that for wheat insurance. There was, in addition, a provision for protection against loss of income from cottonseed.

Problem of Getting Wide Participation

Actual experience has raised many problems in the administration of the program. One of these problems has been that of getting widespread representative participation. In this program, unlike most other Government programs, the job of selling is essential. There is a widely known maxim in the insurance world that, "Insurance is sold, not bought." Most people do not foresee or desire to think about the catastrophes that might occur. The farmer usually plants his crops with high hopes of adequate reward for his efforts. He sees in the future a bountiful harvest and good prices. But drought, floods, hail, and insects attack somewhere each year. It is only after the catastrophe occurs that a backward look points out the folly of failure to protect against such catastrophes before they occur. The job of selling insurance is required to convince him in advance that it is worth while to put a small portion of his income into a "stop loss" provision.

It is necessary to sell insurance not only to get the necessary volume of business but to get the right kind of business. Insurance companies

cannot operate on a "come and get it" basis. Invariably the majority of the business so obtained would be the poorer risks—those persons who can foresee better than the insurer the possibilities of loss.

Determination of Rates

Another difficult problem in both the wheat and cotton programs has been the determination of accurate and applicable average yields and premium rates for individual farms. Although annual yield data existed for some of the farms from which average yields and rates could be computed, these data were not as reliable as originally believed and often were no longer applicable because of changes in ownership, operation, and methods of farming. Figures for many farms had to be appraised. Data on current crops have been collected for individual farms each year and built into the average yields and rates for such farms, so that at present the average yields and rates established are probably the best in the history of the program. The work that has been done represents a large investment in factual data.

One of the biggest difficulties encountered has been adverse selection of risks. In wheat the biggest chance of selection arose from a knowledge by the grower of soil-moisture conditions before seeding—a major factor in the production of the crop in some areas. Also in the rotation of crops the chances of loss in some years are greater than in others. These possibilities of adverse selection were recognized even before the legislation was passed and tentative plans called for a term contract, but legislation as enacted provided for annual contracts for the first 3 years. Attempts were made to reduce the amount of adverse selection under the annual contract by advancing the closing dates for acceptance of applications as far as practicable and requiring applicants for insurance in any county to insure all of their farms in the county. In 1943 a 3-year contract was adopted. The benefits to the Corporation of that contract in avoiding adverse selection would not be felt until 1944, the second year of the contract.

Acreage Abandonment Problem

Another difficulty encountered in the administration of the program arose from acreage abandonment. On an average approximately one-sixth of the Nation's wheat acreage is abandoned. Some of this acreage is abandoned early enough to permit the planting of other crops; some is abandoned at harvesttime because it will not pay the cost of harvesting.

The amount of cotton acreage abandoned is not as large. However, it is often necessary to replant cotton a number of times in order to get a stand. Just how late in the season a farmer should be required to replant instead of being paid an indemnity for the loss of his crop is a difficult problem of administration. When the crop on any acreage is not carried through to completion the cost incurred is less than for a completed crop. To reflect this savings in cost, plans for 1944 insurance provided that the amount of indemnities in such cases would be reduced. This plan is being tried as an experiment on the

1943 American Egyptian cotton crop. It is believed that such a provision would make a substantial reduction in the amount of indemnities to be paid without undue hardship to the insured and at the same time would accomplish a higher degree of equity among insured farmers.

One of the reasons advanced for discontinuance of the crop insurance program was the fact that insurance was carried by less than the majority of the farmers. Insurance participation in wheat increased from 165,000 farms in 1939 to 487,000 in 1943. This represents about one-third of the wheat producers who are eligible for insurance. It should not be presumed that crop insurance will ever be taken universally by all producers. This record compares favorably with the amount of other types of insurance carried by farmers. These other types of insurance have been available for many years, yet only a part of the farmers carry such insurance. In cotton, during each of the first 2 years approximately 10 percent of the producers carried insurance. This record is not as satisfactory as for wheat. Of course, the cotton program had not been in operation as long as the wheat program.

Losses Exceeded Premiums

The other principal reason advanced for discontinuing the insurance program was that losses were larger than the premiums collected. Losses on wheat during the first 4 years averaged about 150 percent of the premiums. In 1939 and 1940 losses were heaviest in the hard winter wheat areas of the southern and central Plains States. In 1940, three-fourths of the insurance losses resulted from drought, and although figures are not available the situation was probably essentially the same in 1939. In 1941, 58 percent of the losses resulted from winter-kill in an area from central Nebraska east to central Illinois. Again in 1942, heaviest losses occurred in what is normally a low-risk area. Heavy losses occurred from excess moisture, poor seeding and growing conditions, and winter-kill in an area from eastern Kansas to Indiana. Heavy losses also occurred in the southern part of Oklahoma and northern Texas from green bug infestation. It appears that heaviest losses for 1943 will also be in normally lower-risk areas. Thus in 2 of the 5 years, losses were heaviest in the normally high-risk areas and in 3 of the years heaviest in what is normally the low-risk areas. When the program was originally established, many felt that its benefits would accrue largely to the high-risk area, but the experience record thus far does not indicate that to be the case, since both the heaviest participation and the heaviest losses have been in the low-risk areas.

Experience With Cotton

In the first year of the cotton insurance program, losses averaged 166 percent of the premiums. Heaviest losses occurred in Alabama, Georgia, South Carolina, Oklahoma, and Texas.

The loss experience has been higher than originally anticipated. Premium rates have been increased somewhat, but it was believed unwise to raise the rates up to the level of the losses as this would drive

out of the insurance program some of the best risks. It is believed that the better plan is to improve the administration so that insurance can be available to all farmers who want it at rates commensurate with their risks.

An examination of experience indicates that in a great many counties losses have been especially heavy in years of exceptionally poor crops, but enough premium can be saved in years of good crops in such counties to efface that deficit. Many counties in years of good crops, with hundreds and even thousands of farms insured, have come through the year without paying a single indemnity. This means that all of the premiums in those years may be saved to meet heavy losses in other years. Out of 1,633 counties in which wheat was insured in 1942, 245 counties paid no losses and 308 counties paid losses less than one-fourth of their premiums. In 961 counties, or substantially more than half of them, losses paid were less than premiums collected.

Many who advocated the crop insurance originally stated that it would be 10 years before final judgment could be passed. One insurance executive who testified before the Senate committee when the program was being considered originally stated that, "It takes 25 years experience in the insurance business before you can get practical figures to base your experience on." New types of insurance, like other new enterprises, have to go through a development period.

Intangible Results Important

It does not seem, however, that crop insurance should be judged entirely on the basis of whether it can be made self-supporting. During the 4 years of operation from 1939 to 142 inclusive, about half a million farmers were assisted in years when they had crop failures. Undoubtedly, the benefits provided many a living until the next crop was made. Moreover, all farmers who carried insurance each year had the advantage of protection against elements beyond their control even though they were not indemnified that particular year. These intangible results, things that cannot be expressed in figures, may be the most significant ones.

It was generally recognized that the crop insurance for wheat and cotton was of an experimental nature and that if successful the program might ultimately be extended to other crops. In fact, research work had been done on corn, tobacco, and citrus fruits and started on rice. Considerable thought had been given to the possibility that if insurance was successful on individual crops, that a plan could be devised for over-all insurance on farms; i. e., insuring all crops produced as a unit rather than each crop separately.

Basic Legislation Stands

The recent action of Congress may not mean that the idea of crop insurance has been definitely and permanently abandoned. The basic legislation to provide for crop insurance remains on the statutes. The general principle and the need for crop insurance were not questioned. The President expressed regret at the action of Con-

gress and his hopes that when Congress returned, funds would be provided for continuance of the program.

In view of the fact that an insurance program such as has been carried on in the past 5 years would never protect all farmers against loss because all farmers would not buy such insurance, it might be wise to consider some type of crop protection that would be universal. One approach to such a plan would be compulsory insurance. This type of insurance is found in many foregn countries, but perhaps it would not be as acceptable in this country.

Another possible approach would be to provide free insurance to all persons who carry out farm practices consistent with the Nation's interest in conserving the permanent productivity of its soil. Public funds have been used for this purpose in the past, and such a plan would not be inconsistent with established policy. Furthermore, since widespread payment of indemnities for crop losses would relieve the necessity for relief payments in case of crop disaster, two ends might be accomplished through such a program.

War Risk Problems

Early this year a study had been made on the possibilities of free insurance on crops whose acreage must be greatly expanded to meet wartime needs. Many persons have advocated such insurance on the ground that it would be a real stimulus to the expansion of acreage. The principal incentive used thus far has been price support but the farmer who is expanding his acreage of war crops encounters not only the price risk but the production risk. Such insurance would provide that the Government would assume a part of the production risk as well as the price risk. Studies that were made of such insurance were based upon insurance on the basis of protecting the investment in the crop. An estimate of the cost of such insurance was made for the following crops: Potatoes, flax, hemp, peanuts, soybeans, dry beans, and dry peas. For these seven crops the estimated cost of indemnities plus a small amount for administration, for an average crop year was $100,000,000, for a good crop year $70,000,000, and for a poor crop year $150,000,000. It is believed that this proposal has much merit and should be given careful consideration as a temporary wartime expedient.

ELECTRIFICATION OF THE FARMS

The importance of the Nation's rural electric power lines to the production of its food has been recognized. Prior to Pearl Harbor the Rural Electrification Administration had been vigorously extending central station electricity to rural regions. During the fiscal year of 1941, for example, its borrowers built and energized 75,000 miles of line and brought power to 225,000 users.

Then, even before the advent of war, came a period of stock taking and of appraisal. The Nation's raw materials, its copper and steel, had to be conserved. Each undertaking that claimed the use of war materials had to be examined from a consideration of national service. Therefore, in July 1942, construction of 32 REA-financed systems which had been begun before the war was ordered halted. Only the most urgent line extensions were permitted.

In January 1943 the War Production Board specifically recognized the importance of electricity on the farm. It issued a new ruling which permitted line extensions up to 5,000 feet to farms which had or were producing a minimum of 10 "animal units" and at least 1 unit for each 100 feet of line. Each farm, before it could be connected to a power line, needed to have or be able to get without priority such electrical farm equipment as a water pump, pig or chicken brooder, motor, feed grinder, or milker.

An "animal unit," for the purpose of the WPB ruling, is 1 milk cow, or 30 breeding ewes, or 3 brood sows, or 160 lambs per year in feed lot, and so on.

Two months later, in March 1943, WPB modified this order, halving the minimum number of food animal units required to complete service extensions.

In April 1943 WPB issued an order to complete some of the REA-financed systems whose construction had been halted the previous July.

As a result of these rulings, during the fiscal year 1943 about 60,000 members were added to the REA-financed systems.

Electricity's Farm Value Proved

These modifications of the WLB regulations came because electricity has shown great value both in increasing food production and as a labor saver. Some studies show that a kilowatt-hour of electricity represents the work equivalent of a full day of a farm hand's labor. The electric milker, for example, enables a worker to milk about two and one-half times as many cows as one who does the job manually. It also permits this job to be done by women, children, and others lacking in sheer physical strength, and releases highly skilled farm laborers for greater attention to other tasks. Pumping water to the cow stalls can increase milk production by 8 to 15 percent. Simi-

larly, water pumped to hen houses and henhouse lighting not only are beneficial to the chickens but help to prevent seasonal slumps in egg production.

During the last few years pig and chick brooders, frequently home-built from scrap or idle materials, have become increasingly popular with farmers. Modified versions of the pig brooder are also used for lambs. Many schools and neighborhood organizations have become interested in the making of equipment, especially brooders, which cannot be readily bought at this time.

This year, as the Nation became increasingly concious that it faced a possible feed shortage, pig brooders assumed new importance. Users say that the pig brooder reduces pig-farrowing losses by an average of as much as one pig in each litter; one university released a survey report during the year which indicates that the saving is over 30 percent. Farmers consequently are able to produce the same number of pigs from fewer brood sows, and with less feed. The electric chick brooder, too, helps to conserve feed because it produces more live, healthy chicks per batch.

Electric milk cooling and electrically pumped water have added producers to milk sheds of war-congested cities. Electric power has meant, in some instances, the opening of whole new areas in milk-sheds, because it brings clean, modern production methods to neighborhoods that previously lacked means of meeting health-department standards.

Aids Food Preservation

Electricity is also important in the preservation of food. Thousands of farm women prefer to can garden surpluses on their electric ranges or to use their electric cookers because they are easier and less oppressive to operate than the old-fashioned coal or wood range. This year another method of food preservation, dehydration, has attracted wide attention. Numerous State, Federal, and other agencies have published plans for home-built electric dehydrators and the WPB has authorized production of 100,000 manufactured models.

Electricity, within the home, has been of increased benefit to the farm wife as the war has added to her normal duties. Now, with a larger Victory Garden to tend, with more farm chores, with Red Cross and Office of Civilian Defense and other civic tasks, she becomes increasingly dependent on her time-saving electric appliances.

REA printed and distributed several million leaflets during the year aimed at helping the farmer to make his own electric equipment when that was practical and to conserve his present equipment and also to help farm families to make full use and to take the best possible care of their electric appliances.

Although the Nation's war plant approached completion during 1942 and there was a natural slacking in requests for rural industrial war-load connections, several hundred such requests were received.

Nonfarm Users Interested

Nonfarm users that became interested in connecting to REA-financed power lines included Army and Navy camps, ordnance plants, airbases, hospitals, ammunition dumps, internment camps, sewage

plants, bridges, water systems, telephone booster systems, lumber mills, tin, coal, fluorspar, bauxite and zinc mines, oil pipelines, wells, elevators, hemp processors, commercial dehydrator plants, quarries, and gravel pits. REA borrowers serve thousands of rural nonfarm users with power which is enabling them to carry on essential war functions.

REA engineers and other personnel are serving their Nation both in civilian roles and with the armed forces. A group of highly trained engineers helped to build the telephone line along the Alcan Highway. Other REA scientists, now with the Army and Navy for the duration, are working with radar. More than 250 REA men and women are now in the armed services. They have seen action on every front in which our forces have been engaged.

REA was established in 1935 for the purpose of bringing central-station power to rural regions which were not hitherto served. It has consistently maintained the policy of making service available to all the persons within an area. Feasibility studies of extensions, acquisitions, or new projects reflect this point of view.

For some time REA has financed the purchase of scattered existing power facilities where such facilities are necessary to reach unserved areas. With a curtailment of new construction, which has coincided with the breaking-up of holding companies and with the throwing of many small systems on the market, the REA acquisition program last year bulked larger in the total REA picture than it would have done in a normal year.

Position at Fiscal Year End

At the close of the fiscal year 1943 the number of borrowers was 868, of which 795 were cooperatives. Total allotments to these borrowers was $466,881,323, of which $369,152,582 had already been advanced, and 805 systems had lines already in service. They operated a total of 382,000 miles of energized lines and served 1,040,000 consumers. In this year these consumers used about 1,475,000,000 kilowatt-hours of energy, which represents an increase of 65 percent over the previous year. The increase is partly accounted for by the increase in number of consumers and partly by the addition of some heavy war loads. But average use per member is also rising as farmers learn how to use their power productively and apply it to produce more wartime food with less labor available.

On their Federal loans REA's borrowers have paid $48,705,976.10 in interest and principal. This represents $12,663,787.57 in advance payments. REA borrowers have also made very substantial investments in war bonds out of their emergency reserve funds. Total delinquencies at the year end amounted to only $181,125.91 for both interest and capital.

According to a study made by the National Resources Planning Board, almost 4 million farms remain to be electrified, in addition to more than a half million nonfarm rural users such as schools, churches, mines, industries, nonfarm rural residents, etc. REA is making a survey to determine the scope of the remaining task and its implications to our post-war economy. At the close of the fiscal year 1943 loan applications exceeded $104,000,000.

AGRICULTURE WHEN THE WAR ENDS

As victory draws nearer the importance increases of estimating what adjustments will be necessary in agriculture when the fighting stops. Accordingly, the Department has tried to foresee what pattern our agriculture will have then, and what food requirements will exist in the early post-war years. It has also endeavored to gage the probable post-war condition of our agricultural plant, in crop and pasture land, range land, forest resources, farm buildings and machinery, technical facilities, farm finance, and other main features. The findings, though highly tentative, provide part of the necessary basis for post-war planning.

Broadly, the pattern our agriculture will have reached in 1944 shows what it will be like when the war ends. This is because in 1944 we shall be close to the top limit in our agricultural production, and because the composition of the output will be approximately fixed for the duration. We can still bring some additional land into cultivation and can still do some shifting into more productive crops and livestock products. But we are approaching the point at which the opportunity for such changes will be small. It seems probable that the level of total production we can expect in 1944, with normal yields, will be close to the maximum under wartime conditions and that only minor changes will develop for the remainder of the war period.

Food Needs To Be Higher

Food requirements, however, will continue to rise, and will be higher at the close of the war than they are now. Tentative estimates for 1944 and 1945 indicate large increases in the requirements over 1943 supplies. Moreover, these estimates assume that certain marked changes will be brought about in civilian food habits and also that certain shipping limitations will persist. Should the anticipated changes in civilian food habits not take place, and should the shipping situation improve greatly, the food-requirement estimates will have to be raised.

As a matter of fact, the Department believes it would be more accurate to speak, not of food requirements or of food needs, but of estimates of supplies that will be taken if they can be produced. Endeavoring to meet them will involve modification of the cropping pattern in the direction of crops that can be used direct for human consumption. Needs capable of being supplied will be greater after than during the war, since blockades will be suspended.

Probable War-End Picture

On the assumption that the foreshadowed 1944 crop picture will closely foreshadow that of the war's end, it may be useful briefly to

summarize it. In vegetables for the fresh market and for processing, the acreage may be 10 to 20 percent over that in 1942, along with very large increases in potatoes and sweetpotatoes. Further expansion is likely in dry beans and peas, in soybeans, peanuts, and flaxseed. Surgarcane acreage may not change much but the sugar-beet acreage probably will be considerably higher than in 1943. Wheat acreage may be from 65 to 70 million acres, or about 25 percent above the acreage seeded in 1943. Corn acreage likely will be higher than in 1943 but the acreage of other feed grains may decline somewhat below the 1943 level, to make room for expansion in food crops. The cotton acreage will be dependent to some extent on the attention given in the cotton States to food crops. For tobacco the outlook for change in the acreage is somewhat uncertain but it appears now that it will go somewhat higher.

In livestock numbers and production the prospect is clear. It is simply not possible, under any feed-production program that might be adopted, to maintain the present livestock population. Undoubtedly the greatest reduction will take place in hogs, since hogs depend more than other livestock on grain, and can be contracted more readily than can roughage-consuming livestock. Fattening of beef cattle and sheep also probably will be curtailed sharply. Milk production and egg production may fall below the level desired unless vigorous measures assure dairymen and poultrymen a more adequate feed-grain supply. Some change from feed to food crops, which as previously mentioned is necessary to obtain the maximum production of nutrients, means some change in all categories of livestock production.

Expected Condition of the Land

As to the probable condition of our land when we get through with the war effort, the Department believes much will depend on the extent to which practical erosion-prevention practices can be combined with increased production of soil-depleting crops. So far the rate of soil depletion has apparently not been very much accelerated. But we have been in the war less than 2 years, during which period the extra drain upon our land resources may not fully have shown up. Current production plans, such as the program for an expanded acreage of wheat and of intertilled crops like soybeans, peanuts, dry beans and peas, and potatoes and sweetpotatoes, involve difficult soil maintenance. Less favorable weather conditions may give rise to some serious problems on farm pasture lands, especially where overgrazing exists.

Strenuous efforts have gone into conservation work during the last 10 years, but at least 60 percent of our cropland area is still in need of conservation practices. Main requirements include crop rotations or improved crop rotations; contour cultivation; terracing; improvement of impaired drainage systems and development of new systems; reorganization of farm irrigation; installation of water-spreading systems on certain range and pasture lands; and utilization of crop residues and fertilizers. The war effort produces conditions that may lead to serious productivity losses if farm and ranch operators fail to

maintain and improve their soil-and-water-conservation systems. Advantages gained in years of cooperative work could be lost.

Forest Impairment Likely

Our forest resources, as another part of this report shows in more detail, are suffering from the impact of the war. On private forest land the extent and severity of destructive cutting have increased, conspicuously in second growth forests east of the Plains. Further heavy inroads are being made into already depleted stands of hardwoods in Ohio, Indiana, Illinois. The war has emphasized the indispensability of forests in national defense, and accentuated the basic trend of forest depletion. Billions of feet of lumber have been required to house soldiers and industrial workers and to provide wood and wood derivatives for ships, wharves, airplanes, gunstocks, explosives, and other war supplies. Much forest land is not restocking. Great need exists for a stoppage of destructive cutting, for increased tree planting, for timber-stand improvement, and for insect, disease, and forest-fire control.

Farm Buildings and Fences

By the end of 1944 farm buildings and fences will have deteriorated somewhat. Less than half the usual quantity of repair materials is available, and the end of the war will see a considerable accumulated need for improvements. In machinery the position will be more favorable in drawbar power than in transport vehicles. The upward trend in tractor numbers will continue; but tractors and other farm machinery will remain in use for longer than normal periods, and the replacement demand will probably be large when abundant new supplies become available. On the other hand, the number of motor vehicles on farms in 1944 may be 10 percent below the 1942 figure. They will be below par in general efficiency, and tire replacements will undoubtedly still be difficult. In general during the war period the allocation of new farm machinery has been on the basis of present numbers, and regions in which equipment was relatively old have not been able to get sufficient replacements.

Farm Technology as War Shapes It

In farm technology the war is having a stimulating influence. Good prices and incomes give farmers more incentive and also more power to adopt improved methods. Though shortages of materials block the development along some lines, shortages of labor often encourage it. Some wartime technical progress, however, may have only limited peacetime application, notably in connection with products which may then be more easily and cheaply obtainable abroad.

Technological advances have been noteworthy in the processing, preservation, and packaging of foods; in the development of higher yielding strains and varieties of crops; in the improvement of methods for controlling agricultural pests and diseases; in farm machinery;

and in livestock breeding and feeding. New methods of dehydrating vegetables, eggs, dairy products, and meats turn out many products which are highly stable, readily soluble, and usable in most ways in which the fresh products may be used. Greater utilization of nonfat milk solids is taking place. New processes in quick freezing hold most of the original fresh quality in frozen foods, and the depression-born freezer-locker industry now handles some billions of pounds of food annually for a million and a half families.

Varieties of corn have been developed which are highly resistant to the European corn borer and to destructive diseases. Rust- and smut-resistant varieties of oats are greatly outyielding old varieties. Several new improved varieties of potatoes have been developed. Progress has been made with soybeans, vegetables, tobacco, and cotton. In insect control the use of aerosols has given results of military value against disease-carrying mosquitoes. New machines for mechanical blocking and machine harvesting greatly reduce the labor required in producing sugar beets. Animal research is extending the importance of progeny testing and discovering the specific uses of vitamins, minerals, forage, pasture, hay, and silage. New findings in fertilizer practice are increasing crop production.

Need for Redirection of Marketing

Some redirection of the marketing system will be in order when the war is over. Distributors will face the task of handling in domestic trade a considerable part of the supplies that now go into military and lend-lease channels. They will have to relocate certain marketing facilities to allow for indicated changes in crop areas and in the relative importance of different crops. Great strides may be made in the development of facilities for preserving and distributing frozen foods. Post-war changes in the volume and direction of world trade will pose problems for processors and distributors, in the solution of which research may be required. For example, certain branches of our farm production, such as the oil-seed crops, may continue at a higher level than that of the pre-war years, and will consequently diminish the need for imports. If this happens, permanent processing facilities will be necessary to replace the wartime makeshifts. The necessary determinations will obviously have to be economic as well as technical.

Other Determinants of War-End Pattern

Other main determinants of the post-war farm situation, such as the probable level of farm incomes, the extent to which inflation will have crept into the farm land-value structure, the conditions that will determine the character and volume of our export trade, and the degree to which the country unites in programs for the maintenance of employment, include numerous uncertainties. It can be taken for granted that the Government will continue to support farm prices. Legislation already provides for that; but predictions as to what the post-war demand for farm products will be are obviously hazardous.

In general, as already stated, the Department believes the immediate post-war years will be a period of very large demands, both domestic and foreign, for the products of United States farms.

Forecasting farm income with any precision for the duration is impracticable, since no one knows how long the war will last. The Department expects that the current upward trend will continue into 1944. Farm production, however, may show only a moderate over-all increase, and prices will be increasingly subject to ceilings. Moreover, farm prices in 1943 have averaged almost 80 percent above the average for the 5 years 1935–39 and must consequently be expected to rise less hereafter. With lower rates of increase in view for both production and prices, the farm income must show a corresponding trend, though some further additions to farmers' income may result from the operation of purchase-and-sale programs or their equivalent. Average net money incomes of farm families have increased rapidly since the outbreak of the war, and the increase will probably continue into 1944, more strongly in the lower and median income groups than in the top groups. Though farm income may not be much higher when the war stops than it is now, it will be high and will enable farmers to set aside reserves and to finance much of their operating expense without borrowing.

Farms May Average Slightly Larger

Farms for the country as a whole may average slightly larger and the conditions of farm tenure may be somewhat better at the end of 1944 than they were when the war began. Many factors are contributing to produce these changes. Prominent among them are: The drain of farm manpower from the land; the improved financial status of landlords and farm operators, both tenants and owners; the promise of a continuing favorable market for farm products; and the current lag in land values in relation to farm prices and farm incomes. Farmers with adequate machinery and other equipment are trying in many States to enlarge their operating units. In parts of the South, however, the trend seems to be away from wage-labor and toward share-cropping, with a consequent decrease in these areas in the average size of farms. The economic condition of both wage hands and tenants has improved. Farmhouses will probably not be in a better condition generally at the end of 1944 than they were at the time of the 1940 census, because the materials and labor necessary for making improvements are scarce. Better rural housing will be an acute need after the war.

Shortages in Rural Health Services

Shortages in rural health services will be serious when the war comes to an end. With approximately the same burden of disease and death to bear, the rural population has fewer health services and facilities than the urban. As a result, the natural healthfulness of country life suffers heavy detraction, largely from diseases that science can often prevent, such as infant and maternal mortality, diphtheria, typhoid fever, malaria, pneumonia, and pellagra. Farm people gen-

erally cannot get adequate medical attention for minor ailments. Badly infected teeth, poor vision, diseased tonsils, hernias, female pelvis disrepairs, and varicose veins take heavy toll of rural health. Rural sanitation is backward. All these drawbacks tend to increase under wartime conditions, in spite of the current improvement in farm incomes, and will require broad programs for rural health and medical-care planning.

No Utopia in Sight

It seems clear, in short, that agriculture when the war ends will still have many of the problems that troubled it before the war started. Probably its physical resources will have undergone some further deterioration and will not be on a sustained-yield basis in crop, range, or forest areas. To the farm group as a whole, the war will have brought economic gains; and many farmers, through wise management of their incomes, will have retired their debts and accumulated savings. Others, however, may find their gains only temporary; they may find themselves overextended, or involved in unsound speculation.

Formidable economic problems will exist for agriculture even if the wartime gains overbalance the losses considerably for the farm group as a whole. It is not to be expected that the familiar disparity between urban and rural living conditions will be absent, or that problems of tenancy and tenure relations generally will give no further trouble. Problems of marketing facilities, of crop and price adjustment, of rural health and medical care, and of rural housing and sanitation may temporarily be more acute than ever. Prudence requires broad efforts to anticipate at least the worst of these problems and to provide ahead for coping with them.

POST-WAR PLANNING

It was necessary a year ago to recognize that the United Nations were still fighting a defensive war—that our backs were still uncomfortably close to the wall. Though even then the tide was turning, we were only just getting to a place where we could risk a head-on-blow encounter with the Axis war machine.

This year our armies, in one theater after another, have taken matters into their own hands. We have won important victories on every major front. That does not mean that the war has been won. Our most difficult days are still ahead. We are going into the bloodiest phase of the battle, and relaxing even for a single moment will cost lives. But we can foresee the final decision.

Therefore, it is not too soon to begin thinking our way through some of the problems that will follow the conflict, and this thinking and planning will be difficult. Agriculture's share of the task will be large. The consideration of post-war policies, at a time when the Nation's energies are consumed in the war itself, presents many obstacles. There is nothing to be gained in not recognizing the fact.

Some persons fear any consideration of our post-war problems at this time.

But sound thought intelligently directed toward our post-war problems need not jeopardize our all-out war effort. We have an obligation to our fighting men to do some straight, sound thinking about the post-war problems long before the end of the war itself. None of us wants to welcome our boys back into a civilian life that offers only unemployment, depression, undernourishment, and misery. These are not the things we are fighting for.

The time to do much of the necessary planning is while the war is still going on. Only improvisation will be possible if we wait until the fighting stops. No one can draw up a blueprint; too much depends on how and when the war ends. But broad goals can be defined, and steps taken toward achieving some of them. Expressed in its most general form, the over-all farm objective should be adequate production of food and fiber for all, at prices fair to both producer and consumer.

Our World War I Experience

Naturally, when we in agriculture begin thinking about our post-war problems, we hark back to our peacetime farm problems of the 1920's and 1930's. We think of dwindling foreign markets, mounting surpluses, low farm income, too many people on the land, foreclosures, soil depletion, rural slums, and the suffering that was part and parcel of farm life during much of the two decades following the last war.

As compared to the last war, we see millions more men under arms. We see our agriculture even more greatly expanded, we see huge war industries, many of which will be virtually abandoned. In short, we see potentialities of a post-war debacle for agriculture and industry which would make our previous aches and pains seem like the most minor kind of irritation.

The extent to which these threats materialize and drag us down will depend largely, I believe, upon the extent to which we fail to plan the future on the basis of our experience. How much have we really

learned from the last war, and from the unstable peace that followed it? Our planning for the next post-war phase will show. Both nationally and agriculturally we have learned a great many things in the last two decades. Whether we have learned them well enough, and can apply our learning, remains to be seen.

Certainly we should have learned that this Nation is not isolated and cannot be isolated from the rest of the world—either politically, economically, or physically. As a matter of fact, we never were isolated; we only thought we were.

The Four-Power Pact signed in Moscow, the discussions of foreign policy in the Congress, and work done following the United Nations Conference on Food and Agriculture held at Hot Springs last May, indicate that the American people realize we are a world power with commensurate responsibilities. If that be true, then we have taken the important first step in our post-war planning. For, with that realization on the part of the people, it is possible to develop a sound, workable foreign policy for this Nation. And a sound, workable foreign policy is basic not only to the future peace but to our prosperity as well.

Along with the other nations represented at the United Nations Conference on Food and Agriculture, held at Hot Springs, Va., May 18 to June 3, 1943, the United States approved three major objectives: (1) That the governments and authorities represented at the conference should declare to their own people and to one another their intention to secure more and better food for all who need it; (2) that these governments and authorities recognize that a great increase will be needed in the total production of food if this first objective is to be attained; and (3) that the governments and authorities recognize also that it is useless to produce food unless men and nations have the means to acquire it for consumption through a balanced, world-wide expansion of economic activity. These objectives will necessarily influence post-war planning for our own agriculture, as well as our cooperation with other countries in programs for agricultural improvement and better nutrition.

Interdependence of Groups

The second most important thing, from the standpoint of agriculture, which the Nation may have learned, is the interdependence of labor, industry, and agriculture. During the 1920's many people said frankly that the prosperity of industrial America required low farm prices and cheap food. Some thought perhaps a form of peasantry would not be so bad. We had comparatively low farm prices during the twenties. They did not save us from an industrial depression. Farmers learned during the thirties that when men stop working they stop buying. The factory operator learned that his market is only as large as the purchasing power of the farmer and the worker combined. The purely domestic problem from which agriculture can suffer more than any other is mass unemployment.

At this stage, I doubt if we can foresee even the broad outlines of the manner in which we are to shift 10 million men from the serv-

ices and another 10 million from the war industries back into civilian pursuits. Some talk of a huge public-works program; others say industry must and can do the job alone. It is to be hoped that industry can do the job with the very minimum of Government assistance. We cannot have a permanently satisfying economy unless private enterprise carries the major responsibility for employment. However, Government must be ready to take whatever steps are necessary to fill the gaps. In any case, the plan and the program itself are the concern of all.

Promotion of an expanding world economy, with greater trade and a rising scale of living for the entire world, necessitates the discovery of ways to keep our factories and our city workers busy making the things we need. In physical quantities the Nation is now producing over 100 percent more than it ever produced before the war began. Our task is to hold production as near this level as possible, at the same time that we convert factories from war to peace goods, and relax the rationing controls. Not otherwise can we win the battle for better living in both town and country. As our experience in the war has shown, it is clearly possible to produce far above pre-war levels. Ways to to do so, and to maintain markets for that production, must be found.

From the standpoint of agriculture, the key to the problem is the maintenance of a high and well-diffused industrial activity. This is so essential that we can call it a necessary part of an adequate agricultural policy. Without active employment in the cities, we cannot expect to have either a permanently satisfactory market for agricultural products or adequate employment opportunities for underemployed rural people. Maintenance of good farm returns after the war presupposes conditions which will enable consumers of farm products to retain their employment and purchasing power. These conditions will probably include freer trade with other nations, and some Government assistance to industry in readjusting its operations for peacetime purposes.

A third lesson of the twenties and thirties which is national in scope but of particular importance to agriculture relates to the simple fact that it is unwise to permit malnutrition and underconsumption to exist in the midst of farm surpluses. That lesson is being further emphasized by our experience during the war. We are learning, for instance, that it pays to have our soldiers well-fed, and that the workers in our war industries can work longer and better and more efficiently if they have a well-balanced diet. As a Nation, we have learned the elementary fact that just as it is good business for a farmer to feed a balanced ration to his livestock, so it is good business to have all our people eating a balanced diet.

Out of the experience we have gained in the last two decades, people in agriculture should be able to fashion the kind of program that would help, even independently of other decisions, to prevent the misery and the suffering and the unhappiness which stalked the rural areas after the last war. That, it seems to me, is the very minimum that we can do in the way of post-war planning, but the total job goes beyond agriculture.

Nation's Welfare First

One cardinal principle must underlie agricultural discussions and thinking from the very beginning; we must think of the solution of agriculture's problems in terms of the Nation's welfare. If we don't, the program will fail, and agriculture and the whole Nation will suffer. This means that we must be unselfish in our thinking and in our reasoning. We will have to see that local interests do not interfere with national interests. We must see that personal interests do not interfere with the good of the greater number.

The time is short, not because the end of the war is necessarily near at hand, but because the American people—including our farm people—face some of the most important decisions of their lifetime in the immediate months ahead.

The Over-All Objective

Agriculture's task, which involves the general welfare as well as the welfare of farm people, shapes up under three main heads: (1) Adjusting production to requirements in a probable brief demobilization period during which the demand for many agricultural products for civilian and world-relief purposes probably will be as high or even higher than during the war; (2) preparing for an agricultural adjustment to the longer future, through farm programs integrated with industrial programs, and (3) collaborating with other nations to realize the world goals of the United Nations' food conference held last May at Hot Springs, Va.

Following our earlier wars, the country had considerable unoccupied good land readily and immediately available for cultivation. This will not be true to the same extent again. All good land, ready for cultivation, and much of the poorer land, was under cultivation when the war began. The Army and Navy have acquired some 20 million acres of land for use as camps, proving grounds, etc. Fifty thousand farm families have been removed from this land; most of them have gone to work on other farms or moved into war industries. Several million acres of the land taken over for military purposes was good farm land. Only part of this area will be available at the close of the war for conversion back into agricultural use; possibly enough, however, to provide new farmsteads for 25,000 families or more.

In addition, something like 30 to 40 million acres of good land can be made available for settlement through irrigation, drainage, and clearing. From 10 to 20 million acres can be reclaimed in the Western States through irrigation; another 5 million acres of fertile land in the Mississippi Delta can be drained and cleared. Approximately 15 million acres requiring drainage and clearing are located at various points over the country. Realization of the nutrition program outlined at the Food Conference would find uses for all this land, along with whatever agricultural land may be released from military purposes.

More boys and girls grow up on farms in the United States than can find a place in farming or in replacing the older generation who

retire or die. Ordinarily about half of the farm boys and girls are not needed there. When city business is good, the extra farm boys and girls move to the city for their careers. When business is bad, they stay on the farms, where they are not really needed. In addition, unemployed city people move onto the land then and make the surplus rural population even larger. Success in post-war readjustment will mean that more people will be needed in farming, and also that jobs will continue to be available at good pay for workers in city industries. Planning for it should attack the problem of potential land crowding from both ends—on the one hand through an increase in the demand for agricultural products, and on the other hand through the continued provision of chances for farm youth to get nonfarm work. Agriculture must not be a dumping ground for unemployment.

Main Farm Tasks

Careful planning will be required to bring about these needed adjustments in agriculture in the United States as we look ahead to the post-war period. Right now we have to estimate the best we can what additional changes will take place before the end of the war. We must recognize that we will not be entering the post-war period with agriculture just as it is today. The readjustments will have to be planned from the position which agriculture will occupy when the war ends. In planning for the adjustments needed during the early years after hostilities cease we must keep in mind the kind of an agricultural and rural life we would like to have in this country in longer future. Just what kind of an agriculture we can have will depend, of course, upon what kind of international trade relations are established after the war and how effective we are at home in providing the means whereby our own people can purchase ample amounts of nutritious foods and other farm commodities.

We will also have to give attention not only to the full development of our land, water, and forest resources but also to their protection and conservation. And we must not neglect improvements in rural housing, rural electrification, rural health, rural education, and other facilities and services for farm people. The war has demonstrated more than ever before how essential agriculture is to our total economy and national well-being. Farm people now and in the future must share equitably with all other groups both the responsibililities and the benefits of our national effort whether it be in time of war or during the hoped-for durable peace to come. Planning just what agricultural production we should have after the war is over, how to assure that this production is properly distributed, how to conserve our agricultural plant, and how farm people can gradually improve their standard of living is the major challenge to the farm leadership of our generation.

Cooperation With Land-Grant Colleges

The Department, in cooperation with the land-grant colleges, is working with farm people, with farm organizations, and with other

groups interested in agriculture, in considering post-war problems and means of solving them. As yet, though time presses, the job is in only the early stages. If it is to be handled well, it must include attention to a thousand details, from production-planning to the conservation and upbuilding of soil resources. Problems of farm income maintenance, of land-tenure improvement, of creating new farm opportunities, and of extending the benefits of social security legislation to farm people are just a few matters that await thorough study and discussion. The list includes vital problems of world trade, of migration between town and country, of nutrition status, of farm technology, and of general soil and water conservation.

The Department's post-war planning activities began with the work of interbureau committees, which were set up in the summer of 1941. There is an interbureau committee in Washington and nine similar regional committees of field men. At a meeting in St. Louis in August 1942, representatives of these committees outlined particular jobs which they believed should be tackled. They also recommended that representatives of the land-grant colleges should be invited to become members of the regional committees. All these colleges now have representation on the committees. In July 1943 a conference held at Milwaukee, in which representatives of the colleges participated, arranged for expansion and acceleration of the post-war planning work, and suggested a program of activities, in the furtherance of which the Department is now cooperating with the land-grant colleges.

Specific Planning Studies

Among the activities completed or under way in the Department's post-war planning project is a report on national agricultural policy after the war. It covers fundamentals such as production, marketing, maintenance of farm income, tenure conditions, conservation, international trade, and public services and facilities. An early draft was reviewed and completed at the post-war planning conference held last summer in Milwaukee. Another study endeavors to describe what our agriculture will be like when the war comes to an end—what its position will be in terms of crop acreages, kinds of livestock, farm power, land resources, farm machinery, farm buildings, and housing. Still another basic investigation analyzes relationships between farm conditions and industrial activity, both in this country and abroad. The purpose of this study is to develop facts and principles that will help farmers to choose wisely when they have to make decisions on public policies that influence levels of employment, industrial activity, and international trade.

Attention has been given to area programs for the conservation of natural resources and the improvement of rural living conditions. Such programs bring into a common focus problems both in the physical resource field and in the field of farm family living. Prominent in them are problems connected with the relationship of population to resources. The general aim is to analyze the total requirements of different areas, and to work out balanced programs for dealing simultaneously with all the major sore spots, from deficiencies in soil care

to defects in the relationship between country and town. Perhaps it will be necessary to have an expanded public-works program when the fighting stops. Agencies of this Department are cooperating with other branches of the Government in building up a worth-while reserve shelf of projects.

In the foreground of the post-war planning studies is an analysis of probable food and fiber requirements in the demobilization period. It makes various assumptions, since no one can tell as yet how long the war in the Pacific will continue after the war in Europe ends. But we cannot afford to enter the demobilization period with no plans for dealing with it, because in one way or another the demobilization will greatly affect the demand for agricultural products. Attention is being given also to marketing and distribution problems that may be pressing in the demobilization period, especially such problems as can be dealt with speedily.

The Reconversion Problem

Efforts will be made to explore the possibilities of converting war plants of peacetime uses, and a few interested defense plants in farm communities will be assisted experimentally in working out the problem of keeping up jobs after the war production stops. Other investigations will consider problems connected with the reopening of plants closed by the war and with the development of new industries in rural areas. Prospective farmers' demands for industrial products will be studied. Helping to maintain manufacturing in rural areas may serve the double object of improving the local economic balance and providing supplementary employment for agricultural people. These studies will be made in cooperation with other Government agencies, and with agricultural, business, and labor groups.

Another aspect of the rural-urban relationship which has been changed by the war and will be changed again by the peace, concerns the land now being used for such military purposes as war plants, cantonments, bombing ranges, etc., some of it acquired by the Government from private owners. The Department will try to determine what opportunities may be expected for reconverting a portion of this land to agricultural uses. Some land in public ownership which is now used for military purposes may again become available for farming, forestry, and grazing when the war is over. The reconversion problem will have to be studied.

Agriculture's Population Capacity

Especially important to agriculture is a study now going forward in the Department to determine how many additional people agriculture may reasonably be expected to absorb. Agriculture can no doubt provide opportunities for some returned soldiers and war-industry workers. As mentioned already, however, it is not in a position to withstand a large-scale unguided back-to-the-land movement. Accordingly, the Department will analyze the situation to determine just where the areas are that could absorb additional population, what

dredging, clearing, or irrigating would be required, and how many additional people agriculture might absorb altogether. Studies in the tenure problem will have a bearing on this mater. These will deal also with economic and social effects of tenancy and of programs to assist tenants in reaching the ownership rung of the agricultural ladder.

The post-war planning studies will extend also to the problem of providing social security for farm people. This branch of the investigation will analyze existing social security programs, and will consider various proposals for extending the coverage to self-employed and hired workers in agriculture. Education and information programs for farmers will be influential in the total handling of the post-war problem. Therefore the Department is assisting farmers, farm organizations, and other interested groups to gather data on the issues and problems that are likely to arise. It assists them to participate actively, in their own communities, States, and regions, and also on the national level, in developing and considering plans and proposals.

Final Decisions Up to the People

It is vital, however, not to take these investigations for the planning itself. They are only a means to that end, only a preliminary clearing of the decks. The actual planning cannot be done by any public agency, or even by any group of public agencies; it involves too much that is fundamental in our economic and social life. Economic and social research can assemble facts, principles, and proposals, but it cannot make decisions. Responsibility for actual post-war policy rests with the whole community, which will need to consider unofficial as well as official recommendations and to take full advantage of all facilities for study and discussion. The role of public agencies in the planning process is principally advisory and informational, and without participation and action by the people themselves it cannot be effective.

As a matter of fact, decisions for post-war readjustment will necessitate wide participation by the people, both locally and nationally. They will affect our economic future for years to come, and can be sound and lasting only if based on broad agreement. One-sided proposals, conceived from narrow or selfish viewpoints, won't have a chance. It will not be possible for any groups, even the largest, to make their own post-war plans, and get them adopted without reference to the needs of other groups. Certainly the farmers cannot do that; for matters of interest to agriculture vitally concern industry and labor. Nor can the Department of Agriculture, or the land grant colleges, or the farm organizations make a post-war program for agriculture, though they can and should offer recommendations. All basic post-war programs will be essentially national in scope, and will require the support of practically the entire community. In the making of them everybody must have a hand.

Secretary of Agriculture.

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